

SEQUENCE LISTING

<110> Watson, James D.
Tan, Paul L. J.

<120> Methods and Compounds for the Treatment
of Immunologically-Mediated Diseases of the Respiratory
System using Mycobacterium Vaccae

<130> 11000.1008c2

<150> US09/156,181

<151> 1998-09-17

<150> US 08/996,624

<151> 1997-12-23

<160> 208

<170> FastSEQ for Windows Version 3.0

<210> 1

<211> 25

<212> PRT

<213> Mycobacterium vaccae

<220>

<221> UNSURE

<222> (7)...(7)

<400> 1

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ala | Pro | Val | Gly | Pro | Gly | Xaa | Ala | Ala | Tyr | Val | Gln | Gln | Val | Pro | Asp |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Gly | Pro | Gly | Ser | Val | Gln | Gly | Met | Ala | | | | | | | |
| | | | 20 | | | | 25 | | | | | | | | |

<210> 2

<211> 10

<212> PRT

<213> Mycobacterium vaccae

<220>

<221> UNSURE

<222> (2)...(2)

<400> 2

| | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Xaa | Asp | Gln | Leu | Lys | Val | Asn | Asp | Asp |
| 1 | | | 5 | | | | | 10 | |

<210> 3

<211> 11

<212> PRT

<213> Mycobacterium vaccae

<220>

<221> UNSURE
<222> (2)...(2)

<400> 3

Met Xaa Pro Val Pro Val Ala Thr Ala Ala Tyr
1 5 10

<210> 4
<211> 21
<212> PRT
<213> Mycobacterium vaccae

<400> 4

Thr Pro Ala Pro Ala Pro Pro Tyr Val Asp His Val Glu Gln Ala
1 5 10 15
Lys Phe Gly Asp Leu
20

<210> 5
<211> 29
<212> PRT
<213> Mycobacterium vaccae

<220>
<221> UNSURE
<222> (25)...(25)

<400> 5

Met Gln Ala Phe Asn Ala Asp Ala Tyr Ala Phe Ala Lys Arg Glu Lys
1 5 10 15
Val Ser Leu Ala Pro Gly Val Pro Xaa Val Phe Glu Thr
20 25

<210> 6
<211> 21
<212> PRT
<213> Mycobacterium vaccae

<220>
<221> UNSURE
<222> (6)...(6)

<400> 6

Met Ala Asp Pro Asn Xaa Ala Ile Leu Gln Val Ser Lys Thr Thr Arg
1 5 10 15
Gly Gly Gln Ala Ala
20

<210> 7
<211> 11
<212> PRT
<213> Mycobacterium vaccae

<400> 7

Met Pro Ile Leu Gln Val Ser Gln Thr Gly Arg
1 5 10

<210> 8
 <211> 14
 <212> PRT
 <213> Mycobacterium vaccae

<220>
 <221> UNSURE
 <222> (2)...(2)

<221> UNSURE
 <222> (6)...(6)

<400> 8
 Met Xaa Asp Pro Ile Xaa Leu Gln Leu Gln Val Ser Ser Thr
 1 5 10

<210> 9
 <211> 16
 <212> PRT
 <213> Mycobacterium vaccae

<400> 9
 Lys Ala Thr Tyr Val Gln Gly Gly Leu Gly Arg Ile Glu Ala Arg Val
 1 5 10 15

<210> 10
 <211> 9
 <212> PRT
 <213> Mycobacterium vaccae

<220>
 <221> UNSURE
 <222> (2)...(2)

<400> 10
 Lys Xaa Gly Leu Ala Asp Leu Ala Pro
 1 5

<210> 11
 <211> 14
 <212> PRT
 <213> Mycobacterium vaccae

<220>
 <221> UNSURE
 <222> (12)...(12)
 <223> Residue can be either Glu or Ile

<221> UNSURE
 <222> (2)...(2)

<400> 11
 Lys Xaa Tyr Ala Leu Ala Leu Met Ser Ala Val Xaa Ala Ala
 1 5 10

<210> 12
 <211> 11

<212> PRT
<213> Mycobacterium vaccae

<220>
<221> UNSURE
<222> (10)...(10)

<400> 12
Lys Asn Pro Gln Val Ser Asp Glu Leu Xaa Thr
1 5 10

<210> 13
<211> 21
<212> PRT
<213> Mycobacterium vaccae

<220>
<221> UNSURE
<222> (9)...(9)

<400> 13
Ala Pro Ala Pro Ala Ala Pro Ala Xaa Gly Asp Pro Ala Ala Val Val
1 5 10 15
Ala Ala Met Ser Thr
20

<210> 14
<211> 15
<212> PRT
<213> Mycobacterium vaccae

<220>
<221> UNSURE
<222> (5)...(5)

<400> 14
Glu Ala Glu Val Xaa Tyr Leu Gly Gln Pro Gly Glu Leu Val Asn
1 5 10 15

<210> 15
<211> 15
<212> PRT
<213> Mycobacterium vaccae

<220>
<221> UNSURE
<222> (2)...(2)
<223> Residue can be either Gly or Ala

<221> UNSURE
<222> (15)...(15)
<223> Residue can be either Pro or Ala

<221> UNSURE
<222> (7)...(7)

<400> 15

Ala Xaa Val Val Pro Pro Xaa Gly Pro Pro Ala Pro Gly Ala Xaa
 1 5 10 15

<210> 16
 <211> 15
 <212> PRT
 <213> Mycobacterium vaccae

<400> 16
 Ala Pro Ala Pro Asp Leu Gln Gly Pro Leu Val Ser Thr Leu Ser
 1 5 10 15

<210> 17
 <211> 25
 <212> PRT
 <213> Mycobacterium vaccae

<400> 17
 Ala Thr Pro Asp Trp Ser Gly Arg Tyr Thr Val Val Thr Phe Ala Ser
 1 5 10 15
 Asp Lys Leu Gly Thr Ser Val Ala Ala
 20 25

<210> 18
 <211> 25
 <212> PRT
 <213> Mycobacterium vaccae
 <220>
 <221> UNSURE
 <222> (15)...(15)
 <223> Residue can be either Ala or Arg
 <221> UNSURE
 <222> (23)...(23)
 <223> Residue can be either Val or Leu
 <221> UNSURE
 <222> (16)...(16)

<400> 18
 Ala Pro Pro Tyr Asp Asp Arg Gly Tyr Val Asp Ser Thr Ala Xaa Xaa
 1 5 10 15
 Ala Ser Pro Pro Thr Leu Xaa Val Val
 20 25

<210> 19
 <211> 8
 <212> PRT
 <213> Mycobacterium vaccae

<400> 19
 Glu Pro Glu Gly Val Ala Pro Pro
 1 5

<210> 20
 <211> 25

<212> PRT
<213> Mycobacterium vaccae

<220>
<221> UNSURE
<222> (21)...(22)

<400> 20
Glu Pro Ala Gly Ile Pro Ala Gly Phe Pro Asp Val Ser Ala Tyr Ala
1 5 10 15
Ala Val Asp Pro Xaa Xaa Tyr Val Val
20 25

<210> 21
<211> 15
<212> PRT
<213> Mycobacterium vaccae

<220>
<221> UNSURE
<222> (7)...(7)

<400> 21
Ala Pro Val Gly Pro Gly Xaa Ala Ala Tyr Val Gln Gln Val Pro
1 5 10 15

<210> 22
<211> 15
<212> PRT
<213> Mycobacterium vaccae

<400> 22
Phe Ser Arg Pro Gly Leu Pro Val Glu Tyr Leu Met Val Pro Ser
1 5 10 15

<210> 23
<211> 19
<212> PRT
<213> Mycobacterium vaccae

<400> 23
Phe Ser Arg Pro Gly Leu Pro Val Glu Tyr Leu Met Val Pro Ser Pro
1 5 10 15
Ser Met Gly

<210> 24
<211> 15
<212> PRT
<213> Mycobacterium vaccae

<400> 24
Phe Ser Arg Pro Gly Leu Pro Val Glu Tyr Leu Asp Val Phe Ser
1 5 10 15

<210> 25
<211> 14

<212> PRT
<213> Mycobacterium vaccae

<220>
<221> UNSURE
<222> (1)...(2)

<400> 25
Xaa Xaa Thr Gly Leu His Arg Leu Arg Met Met Val Pro Asn
1 5 10

<210> 26
<211> 20
<212> PRT
<213> Mycobacterium vaccae

<220>
<221> UNSURE
<222> (16)...(16)
<223> Residue can be either Ser or Val

<221> UNSURE
<222> (17)...(17)
<223> Residue can be either Gln or Val

<400> 26
Val Pro Ala Asp Pro Val Gly Ala Ala Ala Gln Ala Glu Pro Ala Xaa
1 5 10 15
Xaa Arg Ile Asp
20

<210> 27
<211> 14
<212> PRT
<213> Mycobacterium vaccae

<220>
<221> UNSURE
<222> (4)...(4)
<223> Residue can be either Tyr or Pro

<221> UNSURE
<222> (8)...(8)
<223> Residue can be either Val or Gly

<221> UNSURE
<222> (9)...(9)
<223> Residue can be either Ile or Tyr

<221> UNSURE
<222> (3)...(3)

<400> 27
Asp Pro Xaa Xaa Asp Ile Glu Xaa Xaa Phe Ala Arg Gly Thr
1 5 10

<210> 28

<211> 15
 <212> PRT
 <213> Mycobacterium vaccae

<400> 28
 Ala Pro Ser Leu Ser Val Ser Asp Tyr Ala Arg Asp Ala Gly Phe
 1 5 10 15

<210> 29
 <211> 16
 <212> PRT
 <213> Mycobacterium vaccae

<220>
 <221> UNSURE
 <222> (2)...(2)
 <223> Residue can be either Leu or Pro

<221> UNSURE
 <222> (1)...(1)

<221> UNSURE
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<221> UNSURE
 <222> (7)...(7)

<221> UNSURE
 <222> (10)...(10)

<400> 29
 Xaa Xaa Leu Ala Xaa Ala Xaa Leu Gly Xaa Thr Val Asp Ala Asp Gln
 1 5 10 15

<210> 30
 <211> 330
 <212> PRT
 <213> Mycobacterium leprae

<400> 30
 Met Lys Phe Val Asp Arg Phe Arg Gly Ala Val Ala Gly Met Leu Arg
 1 5 10 15
 Arg Leu Val Val Glu Ala Met Gly Val Ala Leu Leu Ser Ala Leu Ile
 20 25 30
 Gly Val Val Gly Ser Ala Pro Ala Glu Ala Phe Ser Arg Pro Gly Leu
 35 40 45
 Pro Val Glu Tyr Leu Gln Val Pro Ser Pro Ser Met Gly Arg Asp Ile
 50 55 60
 Lys Val Gln Phe Gln Asn Gly Gly Ala Asn Ser Pro Ala Leu Tyr Leu
 65 70 75 80
 Leu Asp Gly Leu Arg Ala Gln Asp Asp Phe Ser Gly Trp Asp Ile Asn
 85 90 95
 Thr Thr Ala Phe Glu Trp Tyr Tyr Gln Ser Gly Ile Ser Val Val Met
 100 105 110
 Pro Val Gly Gly Gln Ser Ser Phe Tyr Ser Asp Trp Tyr Ser Pro Ala
 115 120 125
 Cys Gly Lys Ala Gly Cys Gln Thr Tyr Lys Trp Glu Thr Phe Leu Thr

130 135 140
 Ser Glu Leu Pro Glu Tyr Leu Gln Ser Asn Lys Gln Ile Lys Pro Thr
 145 150 155 160
 Gly Ser Ala Ala Val Gly Leu Ser Met Ala Gly Leu Ser Ala Leu Thr
 165 170 175
 Leu Ala Ile Tyr His Pro Asp Gln Phe Ile Tyr Val Gly Ser Met Ser
 180 185 190
 Gly Leu Leu Asp Pro Ser Asn Ala Met Gly Pro Ser Leu Ile Gly Leu
 195 200 205
 Ala Met Gly Asp Ala Gly Gly Tyr Lys Ala Ala Asp Met Trp Gly Pro
 210 215 220
 Ser Thr Asp Pro Ala Trp Lys Arg Asn Asp Pro Thr Val Asn Val Gly
 225 230 235 240
 Thr Leu Ile Ala Asn Asn Thr Arg Ile Trp Met Tyr Cys Gly Asn Gly
 245 250 255
 Lys Pro Thr Glu Leu Gly Gly Asn Asn Leu Pro Ala Lys Leu Leu Glu
 260 265 270
 Gly Leu Val Arg Thr Ser Asn Ile Lys Phe Gln Asp Gly Tyr Asn Ala
 275 280 285
 Gly Gly Gly His Asn Ala Val Phe Asn Phe Pro Asp Ser Gly Thr His
 290 295 300
 Ser Trp Glu Tyr Trp Gly Glu Gln Leu Asn Asp Met Lys Pro Asp Leu
 305 310 315 320
 Gln Gln Tyr Leu Gly Ala Thr Pro Gly Ala
 325 330

<210> 31
 <211> 327
 <212> PRT
 <213> Mycobacterium leprae

<400> 31
 Met Ile Asp Val Ser Gly Lys Ile Arg Ala Trp Gly Arg Trp Leu Leu
 1 5 10 15
 Val Gly Ala Ala Ala Thr Leu Pro Ser Leu Ile Ser Leu Ala Gly Gly
 20 25 30
 Ala Ala Thr Ala Ser Ala Phe Ser Arg Pro Gly Leu Pro Val Glu Tyr
 35 40 45
 Leu Gln Val Pro Ser Glu Ala Met Gly Arg Thr Ile Lys Val Gln Phe
 50 55 60
 Gln Asn Gly Gly Asn Gly Ser Pro Ala Val Tyr Leu Leu Asp Gly Leu
 65 70 75 80
 Arg Ala Gln Asp Asp Tyr Asn Gly Trp Asp Ile Asn Thr Ser Ala Phe
 85 90 95
 Glu Trp Tyr Tyr Gln Ser Gly Leu Ser Val Val Met Pro Val Gly Gly
 100 105 110
 Gln Ser Ser Phe Tyr Ser Asp Trp Tyr Ser Pro Ala Cys Gly Lys Ala
 115 120 125
 Gly Cys Thr Thr Tyr Lys Trp Glu Thr Phe Leu Thr Ser Glu Leu Pro
 130 135 140
 Lys Trp Leu Ser Ala Asn Arg Ser Val Lys Ser Thr Gly Ser Ala Val
 145 150 155 160
 Val Gly Leu Ser Met Ala Gly Ser Ser Ala Leu Ile Leu Ala Ala Tyr
 165 170 175
 His Pro Asp Gln Phe Ile Tyr Ala Gly Ser Leu Ser Ala Leu Met Asp
 180 185 190
 Ser Ser Gln Gly Ile Glu Pro Gln Leu Ile Gly Leu Ala Met Gly Asp

195 200 205
Ala Gly Gly Tyr Lys Ala Ala Asp Met Trp Gly Pro Pro Asn Asp Pro
210 215 220
Ala Trp Gln Arg Asn Asp Pro Ile Leu Gln Ala Gly Lys Leu Val Ala
225 230 235 240
Asn Asn Thr His Leu Trp Val Tyr Cys Gly Asn Gly Thr Pro Ser Glu
245 250 255
Leu Gly Gly Thr Asn Val Pro Ala Glu Phe Leu Glu Asn Phe Val His
260 265 270
Gly Ser Asn Leu Lys Phe Gln Asp Ala Tyr Asn Gly Ala Gly Gly His
275 280 285
Asn Ala Val Phe Asn Leu Asn Ala Asp Gly Thr His Ser Trp Glu Tyr
290 295 300
Trp Gly Ala Gln Leu Asn Ala Met Lys Pro Asp Leu Gln Asn Thr Leu
305 310 315 320
Met Ala Val Pro Arg Ser Gly
325

<210> 32
<211> 338
<212> PRT
<213> Mycobacterium tuberculosis

<400> 32
Met Gln Leu Val Asp Arg Val Arg Gly Ala Val Thr Gly Met Ser Arg
1 5 10 15
Arg Leu Val Val Gly Ala Val Gly Ala Ala Leu Val Ser Gly Leu Val
20 25 30
Gly Ala Val Gly Gly Thr Ala Thr Ala Gly Ala Phe Ser Arg Pro Gly
35 40 45
Leu Pro Val Glu Tyr Leu Gln Val Pro Ser Pro Ser Met Gly Arg Asp
50 55 60
Ile Lys Val Gln Phe Gln Ser Gly Gly Ala Asn Ser Pro Ala Leu Tyr
65 70 75 80
Leu Leu Asp Gly Leu Arg Ala Gln Asp Asp Phe Ser Gly Trp Asp Ile
85 90 95
Asn Thr Pro Ala Phe Glu Trp Tyr Asp Gln Ser Gly Leu Ser Val Val
100 105 110
Met Pro Val Gly Gly Gln Ser Ser Phe Tyr Ser Asp Trp Tyr Gln Pro
115 120 125
Ala Cys Gly Lys Ala Gly Cys Gln Thr Tyr Lys Trp Glu Thr Phe Leu
130 135 140
Thr Ser Glu Leu Pro Gly Trp Leu Gln Ala Asn Arg His Val Lys Pro
145 150 155 160
Thr Gly Ser Ala Val Val Gly Leu Ser Met Ala Ala Ser Ser Ala Leu
165 170 175
Thr Leu Ala Ile Tyr His Pro Gln Gln Phe Val Tyr Ala Gly Ala Met
180 185 190
Ser Gly Leu Leu Asp Pro Ser Gln Ala Met Gly Pro Thr Leu Ile Gly
195 200 205
Leu Ala Met Gly Asp Ala Gly Tyr Lys Ala Ser Asp Met Trp Gly
210 215 220
Pro Lys Glu Asp Pro Ala Trp Gln Arg Asn Asp Pro Leu Leu Asn Val
225 230 235 240
Gly Lys Leu Ile Ala Asn Asn Thr Arg Val Trp Val Tyr Cys Gly Asn
245 250 255
Gly Lys Pro Ser Asp Leu Gly Gly Asn Asn Leu Pro Ala Lys Phe Leu

260 265 270
 Glu Gly Phe Val Arg Thr Ser Asn Ile Lys Phe Gln Asp Ala Tyr Asn
 275 280 285
 Ala Gly Gly Gly His Asn Gly Val Phe Asp Phe Pro Asp Ser Gly Thr
 290 295 300
 His Ser Trp Glu Tyr Trp Gly Ala Gln Leu Asn Ala Met Lys Pro Asp
 305 310 315 320
 Leu Gln Arg Ala Leu Gly Ala Thr Pro Asn Thr Gly Pro Ala Pro Gln
 325 330 335
 Gly Ala

<210> 33
 <211> 325
 <212> PRT
 <213> Mycobacterium tuberculosis

<400> 33
 Met Thr Asp Val Ser Arg Lys Ile Arg Ala Trp Gly Arg Arg Leu Met
 1 5 10 15
 Ile Gly Thr Ala Ala Ala Val Val Leu Pro Gly Leu Val Gly Leu Ala
 20 25 30
 Gly Gly Ala Ala Thr Ala Gly Ala Phe Ser Arg Pro Gly Leu Pro Val
 35 40 45
 Glu Tyr Leu Gln Val Pro Ser Pro Ser Met Gly Arg Asp Ile Lys Val
 50 55 60
 Gln Phe Gln Ser Gly Gly Asn Asn Ser Pro Ala Val Tyr Leu Leu Asp
 65 70 75 80
 Gly Leu Arg Ala Gln Asp Asp Tyr Asn Gly Trp Asp Ile Asn Thr Pro
 85 90 95
 Ala Phe Glu Trp Tyr Tyr Gln Ser Gly Leu Ser Ile Val Met Pro Val
 100 105 110
 Gly Gly Gln Ser Ser Phe Tyr Ser Asp Trp Tyr Ser Pro Ala Cys Gly
 115 120 125
 Lys Ala Gly Cys Gln Thr Tyr Lys Trp Glu Thr Phe Leu Thr Ser Glu
 130 135 140
 Leu Pro Gln Trp Leu Ser Ala Asn Arg Ala Val Lys Pro Thr Gly Ser
 145 150 155 160
 Ala Ala Ile Gly Leu Ser Met Ala Gly Ser Ser Ala Met Ile Leu Ala
 165 170 175
 Ala Tyr His Pro Gln Gln Phe Ile Tyr Ala Gly Ser Leu Ser Ala Leu
 180 185 190
 Leu Asp Pro Ser Gln Gly Met Gly Pro Ser Leu Ile Gly Leu Ala Met
 195 200 205
 Gly Asp Ala Gly Gly Tyr Lys Ala Ala Asp Met Trp Gly Pro Ser Ser
 210 215 220
 Asp Pro Ala Trp Glu Arg Asn Asp Pro Thr Gln Gln Ile Pro Lys Leu
 225 230 235 240
 Val Ala Asn Asn Thr Arg Leu Trp Val Tyr Cys Gly Asn Gly Thr Pro
 245 250 255
 Asn Glu Leu Gly Gly Ala Asn Ile Pro Ala Glu Phe Leu Glu Asn Phe
 260 265 270
 Val Arg Ser Ser Asn Leu Lys Phe Gln Asp Ala Tyr Asn Ala Ala Gly
 275 280 285
 Gly His Asn Ala Val Phe Asn Phe Pro Pro Asn Gly Thr His Ser Trp
 290 295 300
 Glu Tyr Trp Gly Ala Gln Leu Asn Ala Met Lys Gly Asp Leu Gln Ser

305 310 315 320
 Ser Leu Gly Ala Gly
 325

<210> 34
 <211> 338
 <212> PRT
 <213> Mycobacterium bovis

<400> 34

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Gln | Leu | Val | Asp | Arg | Val | Arg | Gly | Ala | Val | Thr | Gly | Met | Ser | Arg |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Arg | Leu | Val | Val | Gly | Ala | Val | Gly | Ala | Ala | Leu | Val | Ser | Gly | Leu | Val |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Gly | Ala | Val | Gly | Gly | Thr | Ala | Thr | Ala | Gly | Ala | Phe | Ser | Arg | Pro | Gly |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Leu | Pro | Val | Glu | Tyr | Leu | Gln | Val | Pro | Ser | Pro | Ser | Met | Gly | Arg | Asp |
| | | 50 | | | | 55 | | | | | 60 | | | | |
| Ile | Lys | Val | Gln | Phe | Gln | Ser | Gly | Gly | Ala | Asn | Ser | Pro | Ala | Leu | Tyr |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Leu | Leu | Asp | Gly | Leu | Arg | Ala | Gln | Asp | Asp | Phe | Ser | Gly | Trp | Asp | Ile |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Asn | Thr | Pro | Ala | Phe | Glu | Trp | Tyr | Asp | Gln | Ser | Gly | Leu | Ser | Val | Val |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Met | Pro | Val | Gly | Gly | Gln | Ser | Ser | Phe | Tyr | Ser | Asp | Trp | Tyr | Gln | Pro |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Ala | Cys | Gly | Lys | Ala | Gly | Cys | Gln | Thr | Tyr | Lys | Trp | Glu | Thr | Phe | Leu |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Thr | Ser | Glu | Leu | Pro | Gly | Trp | Leu | Gln | Ala | Asn | Arg | His | Val | Lys | Pro |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Thr | Gly | Ser | Ala | Val | Val | Gly | Leu | Ser | Met | Ala | Ala | Ser | Ser | Ala | Leu |
| | | | | 165 | | | | | 170 | | | | | 175 | |
| Thr | Leu | Ala | Ile | Tyr | His | Pro | Gln | Gln | Phe | Val | Tyr | Ala | Gly | Ala | Met |
| | | | 180 | | | | | 185 | | | | | 190 | | |
| Ser | Gly | Leu | Leu | Asp | Pro | Ser | Gln | Ala | Met | Gly | Pro | Thr | Leu | Ile | Gly |
| | | 195 | | | | | 200 | | | | | 205 | | | |
| Leu | Ala | Met | Gly | Asp | Ala | Gly | Gly | Tyr | Lys | Ala | Ser | Asp | Met | Trp | Gly |
| | 210 | | | | | 215 | | | | | 220 | | | | |
| Pro | Lys | Glu | Asp | Pro | Ala | Trp | Gln | Arg | Asn | Asp | Pro | Leu | Leu | Asn | Val |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 |
| Gly | Lys | Leu | Ile | Ala | Asn | Asn | Thr | Arg | Val | Trp | Val | Tyr | Cys | Gly | Asn |
| | | | | 245 | | | | | 250 | | | | | 255 | |
| Gly | Lys | Pro | Ser | Asp | Leu | Gly | Gly | Asn | Asn | Leu | Pro | Ala | Lys | Phe | Leu |
| | | | 260 | | | | | 265 | | | | | 270 | | |
| Glu | Gly | Phe | Val | Arg | Thr | Ser | Asn | Ile | Lys | Phe | Gln | Asp | Ala | Tyr | Asn |
| | 275 | | | | | | 280 | | | | | 285 | | | |
| Ala | Gly | Gly | Gly | His | Asn | Gly | Val | Phe | Asp | Phe | Pro | Asp | Ser | Gly | Thr |
| | 290 | | | | | 295 | | | | | 300 | | | | |
| His | Ser | Trp | Glu | Tyr | Trp | Gly | Ala | Gln | Leu | Asn | Ala | Met | Lys | Pro | Asp |
| 305 | | | | | 310 | | | | | 315 | | | | | 320 |
| Leu | Gln | Arg | Ala | Leu | Gly | Ala | Thr | Pro | Asn | Thr | Gly | Pro | Ala | Pro | Gln |
| | | | | 325 | | | | | 330 | | | | | 335 | |

Gly Ala

<210> 35
 <211> 323

<212> PRT

<213> Mycobacterium bovis

<400> 35

Met Thr Asp Val Ser Arg Lys Ile Arg Ala Trp Gly Arg Arg Leu Met
1 5 10 15
Ile Gly Thr Ala Ala Ala Val Val Leu Pro Gly Leu Val Gly Leu Ala
20 25 30
Gly Gly Ala Ala Thr Ala Gly Ala Phe Ser Arg Pro Gly Leu Pro Val
35 40 45
Glu Tyr Leu Gln Val Pro Ser Pro Ser Met Gly Arg Asp Ile Lys Val
50 55 60
Gln Phe Gln Ser Gly Gly Asn Asn Ser Pro Ala Val Tyr Leu Leu Asp
65 70 75 80
Gly Leu Arg Ala Gln Asp Asp Tyr Asn Gly Trp Asp Ile Asn Thr Pro
85 90 95
Ala Phe Glu Trp Tyr Tyr Gln Ser Gly Leu Ser Ile Val Met Pro Val
100 105 110
Gly Gly Gln Ser Ser Phe Tyr Ser Asp Trp Tyr Ser Pro Ala Cys Gly
115 120 125
Lys Ala Gly Cys Gln Thr Tyr Lys Trp Glu Thr Leu Leu Thr Ser Glu
130 135 140
Leu Pro Gln Trp Leu Ser Ala Asn Arg Ala Val Lys Pro Thr Gly Ser
145 150 155 160
Ala Ala Ile Gly Leu Ser Met Ala Gly Ser Ser Ala Met Ile Leu Ala
165 170 175
Ala Tyr His Pro Gln Gln Phe Ile Tyr Ala Gly Ser Leu Ser Ala Leu
180 185 190
Leu Asp Pro Ser Gln Gly Met Gly Leu Ile Gly Leu Ala Met Gly Asp
195 200 205
Ala Gly Gly Tyr Lys Ala Ala Asp Met Trp Gly Pro Ser Ser Asp Pro
210 215 220
Ala Trp Glu Arg Asn Asp Pro Thr Gln Gln Ile Pro Lys Leu Val Ala
225 230 235 240
Asn Asn Thr Arg Leu Trp Val Tyr Cys Gly Asn Gly Thr Pro Asn Glu
245 250 255
Leu Gly Gly Ala Asn Ile Pro Ala Glu Phe Leu Glu Asn Phe Val Arg
260 265 270
Ser Ser Asn Leu Lys Phe Gln Asp Ala Tyr Lys Pro Ala Gly Gly His
275 280 285
Asn Ala Val Phe Asn Phe Pro Pro Asn Gly Thr His Ser Trp Glu Tyr
290 295 300
Trp Gly Ala Gln Leu Asn Ala Met Lys Gly Asp Leu Gln Ser Ser Leu
305 310 315 320
Gly Ala Gly

<210> 36

<211> 333

<212> PRT

<213> Mycobacterium leprae

<400> 36

Met Lys Phe Leu Gln Gln Met Arg Lys Leu Phe Gly Leu Ala Ala Lys
1 5 10 15
Phe Pro Ala Arg Leu Thr Ile Ala Val Ile Gly Thr Ala Leu Leu Ala
20 25 30

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gly | Leu | Val | Gly | Val | Val | Gly | Asp | Thr | Ala | Ile | Ala | Val | Ala | Phe | Ser |
| | 35 | | | | | 40 | | | | | | 45 | | | |
| Lys | Pro | Gly | Leu | Pro | Val | Glu | Tyr | Leu | Gln | Val | Pro | Ser | Pro | Ser | Met |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| Gly | His | Asp | Ile | Lys | Ile | Gln | Phe | Gln | Gly | Gly | Gly | Gln | His | Ala | Val |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Tyr | Leu | Leu | Asp | Gly | Leu | Arg | Ala | Gln | Glu | Asp | Tyr | Asn | Gly | Trp | Asp |
| | | | 85 | | | | | | 90 | | | | | 95 | |
| Ile | Asn | Thr | Pro | Ala | Phe | Glu | Glu | Tyr | Tyr | His | Ser | Gly | Leu | Ser | Val |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Ile | Met | Pro | Val | Gly | Gly | Gln | Ser | Ser | Phe | Tyr | Ser | Asn | Trp | Tyr | Gln |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Pro | Ser | Gln | Gly | Asn | Gly | Gln | His | Tyr | Thr | Tyr | Lys | Trp | Glu | Thr | Phe |
| | | 130 | | | | 135 | | | | | 140 | | | | |
| Leu | Thr | Gln | Glu | Met | Pro | Ser | Trp | Leu | Gln | Ala | Asn | Lys | Asn | Val | Leu |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Pro | Thr | Gly | Asn | Ala | Val | Gly | Leu | Ser | Met | Ser | Gly | Ser | Ser | Ser | Ala |
| | | | 165 | | | | | 170 | | | | | 175 | | |
| Leu | Ile | Leu | Ala | Ser | Tyr | Tyr | Pro | Gln | Gln | Phe | Pro | Tyr | Ala | Ala | Ser |
| | | | 180 | | | | | 185 | | | | | 190 | | |
| Leu | Ser | Gly | Phe | Leu | Asn | Pro | Ser | Glu | Gly | Trp | Trp | Pro | Thr | Met | Ile |
| | | 195 | | | | | 200 | | | | | 205 | | | |
| Gly | Leu | Ala | Met | Asn | Asp | Ser | Gly | Gly | Tyr | Asn | Ala | Asn | Ser | Met | Trp |
| | 210 | | | | | 215 | | | | 220 | | | | | |
| Gly | Pro | Ser | Thr | Asp | Pro | Ala | Trp | Lys | Arg | Asn | Asp | Pro | Met | Val | Gln |
| 225 | | | | 230 | | | | | | 235 | | | | | 240 |
| Ile | Pro | Arg | Leu | Val | Ala | Asn | Asn | Thr | Arg | Ile | Trp | Val | Tyr | Cys | Gly |
| | | | 245 | | | | | | 250 | | | | | 255 | |
| Asn | Gly | Ala | Pro | Asn | Glu | Leu | Gly | Gly | Asp | Asn | Ile | Pro | Ala | Lys | Phe |
| | | | 260 | | | | | 265 | | | | 270 | | | |
| Leu | Glu | Ser | Leu | Thr | Leu | Ser | Thr | Asn | Glu | Ile | Phe | Gln | Asn | Thr | Tyr |
| | | 275 | | | | | 280 | | | | | 285 | | | |
| Ala | Ala | Ser | Gly | Gly | Arg | Asn | Gly | Val | Phe | Asn | Phe | Pro | Pro | Asn | Gly |
| | 290 | | | | | 295 | | | | | 300 | | | | |
| Thr | His | Ser | Trp | Pro | Tyr | Trp | Asn | Gln | Gln | Leu | Val | Ala | Met | Lys | Pro |
| 305 | | | | 310 | | | | | | 315 | | | | | 320 |
| Asp | Ile | Gln | Gln | Ile | Leu | Asn | Gly | Ser | Asn | Asn | Ala | | | | |
| | | | 325 | | | | | | 330 | | | | | | |

<400> 37

14

Ile Asn Thr Pro Ala Phe Glu Glu Tyr Tyr Gln Ser Gly Leu Ser Val
100 105 110
Ile Met Pro Val Gly Gly Gln Ser Ser Phe Tyr Thr Asp Trp Tyr Gln
115 120 125
Pro Ser Gln Ser Asn Gly Gln Asn Tyr Thr Tyr Lys Trp Glu Thr Phe
130 135 140
Leu Thr Arg Glu Met Pro Ala Trp Leu Gln Ala Asn Lys Gly Val Ser
145 150 155 160
Pro Thr Gly Asn Ala Val Gly Leu Ser Met Ser Gly Gly Ser Ala
165 170 175
Leu Ile Leu Ala Ala Tyr Tyr Pro Gln Gln Phe Pro Tyr Ala Ala Ser
180 185 190
Leu Ser Gly Phe Leu Asn Pro Ser Glu Gly Trp Trp Pro Thr Leu Ile
195 200 205
Gly Leu Ala Met Asn Asp Ser Gly Gly Tyr Asn Ala Asn Ser Met Trp
210 215 220
Gly Pro Ser Ser Asp Pro Ala Trp Lys Arg Asn Asp Pro Met Val Gln
225 230 235 240
Ile Pro Arg Leu Val Ala Asn Asn Thr Arg Ile Trp Val Tyr Cys Gly
245 250 255
Asn Gly Thr Pro Ser Asp Leu Gly Gly Asp Asn Ile Pro Ala Lys Phe
260 265 270
Leu Glu Gly Leu Thr Leu Arg Thr Asn Gln Thr Phe Arg Asp Thr Tyr
275 280 285
Ala Ala Asp Gly Gly Arg Asn Gly Val Phe Asn Phe Pro Pro Asn Gly
290 295 300
Thr His Ser Trp Pro Tyr Trp Asn Glu Gln Leu Val Ala Met Lys Ala
305 310 315 320
Asp Ile Gln His Val Leu Asn Gly Ala Thr Pro Pro Ala Ala Pro Ala
325 330 335
Ala Pro Ala Ala
340

<210> 38
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Probe made in a lab

<400> 38
agcggctggg acatcaacac

20

<210> 39
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Probe made in a lab

<400> 39
cagacgcggg tgttggtggc

20

<210> 40
<211> 1211

<212> DNA

<213> Mycobacterium vaccae

<400> 40

| | | | | | | |
|------------|------------|------------|------------|-------------|-------------|------|
| ggtaccgga | gctggaggat | tgacgggatg | agacttcttg | acaggattcg | tgggccttgg | 60 |
| gcacgccgt | tggcgctcgt | ggctgtcgcg | acagcgatga | tgcttgcttt | ggtgggcctg | 120 |
| gctggagggt | cggcgaccgc | cggagcattc | tcccggccag | gtctgcccgt | ggagtacctg | 180 |
| atggtgcctt | cggcgctgat | ggggcgcgac | atcaagatcc | agttccagag | cgggtggcgag | 240 |
| aactcgccgg | ctctctacct | gctcgacggc | ctcggtgcgc | aggaggactt | caacggctgg | 300 |
| gacatcaaca | ctcaggcttt | cgagtgggtc | ctcgacagcg | gcatctccgt | ggtgatgccg | 360 |
| gtcgggtggc | agtccagctt | ctacaccgac | tggtagccgc | cggcccgtaa | caagggcccg | 420 |
| accgtgacct | acaagtggga | gaccttccct | acccaggagc | tcccgggctg | gctgcaggcc | 480 |
| aaccgcgcgg | tcaagccgac | cggcagcggc | cctgtcgggt | tgtcgatggc | gggttcggcc | 540 |
| gcgctgaacc | tggcgacctg | gcacccggag | cagttcatct | acgcgggctc | gatgtccggc | 600 |
| ttcctgaacc | cctccgaggg | ctgggtggcg | ttcctgatca | acatctcgat | gggtgacgcc | 660 |
| ggcggcttca | aggccgacga | catgtggggc | aagaccgagg | ggatcccaac | agcggttgga | 720 |
| cagcgcaacg | atccgatgct | gaacatcccg | accctggctg | ccaacaacac | ccgtatctgg | 780 |
| gtctactgcg | gtaaccggca | gcccacggag | ctcggcgggc | gcgacctgcc | cggcacgttc | 840 |
| ctcgaaggtc | tgaccatccg | caccaacgag | accttccgcg | acaactacat | cggcgcggtt | 900 |
| ggccacaacg | gtgtgttcaa | cttcccggcc | aacggcacgc | acaactgggc | gtactggggt | 960 |
| cgcgagctgc | aggcgatgaa | gcctgacctg | caggcgcaac | ttctctgacg | gttgacgaa | 1020 |
| acgaagcccc | cggccgattg | cggccgaggg | tttcgtcgtc | cggggctact | gtggccgaca | 1080 |
| taaccgaaat | caacgcgatg | gtggctcatc | aggaacgccg | aggggggtcat | tgcgtacga | 1140 |
| cacgaggtgg | gcgagcaatc | cttctgtccc | gacggagagg | tcaacatcca | cgtcgagtac | 1200 |
| tccagcgtga | a | | | | | 1211 |

<210> 41

<211> 485

<212> DNA

<213> Mycobacterium vaccae

<400> 41

| | | | | | | |
|------------|------------|-------------|-------------|-------------|------------|-----|
| agcggctggg | acatcaaac | cggcgcttc | gagtggtaag | tgcactcggg | tctcgcggtg | 60 |
| atcatgccc | tggcgggca | gtccagcttc | tacagcgact | ggtacagccc | ggcctgcggg | 120 |
| aaggccgggt | gccagacct | caagtgggag | acgttccctga | cccaggagct | gccggcctac | 180 |
| ctcgccgcca | acaagggggg | cgaccgaac | cgcaacgcgg | ccgtcgggtc | gtccatggcc | 240 |
| gggttcggcg | gcgtgacgct | ggcgatctac | caccgcagc | agttccagta | cggcgggctg | 300 |
| ctgtcgggct | acctgaaccc | gtccgagggg | tgggtggcga | tgctgatcaa | catctcgatg | 360 |
| ggtgacgcgg | gcggctacaa | ggccaacgac | atgtgggggt | caccgaagga | cccagacagc | 420 |
| gcctggaagc | gcaacgaccc | gatgggtcaac | atcggcaagc | tgggtggccaa | caacaccccc | 480 |
| ctctc | | | | | | 485 |

<210> 42

<211> 1052

<212> DNA

<213> Mycobacterium vaccae

<400> 42

| | | | | | | |
|-------------|------------|------------|-------------|------------|------------|-----|
| gttgatgaga | aaggtgggtt | gtttgccgtt | atgaagttca | cagagaagtg | gcggggctcc | 60 |
| gcaaaggcgg | cgatgcaccg | ggtgggcgtt | gccgatatgg | cggcggttgc | gctgcccggg | 120 |
| ctgatcggct | tgcgcggggg | ttcggcaacg | gccggggcat | tctcccggcc | cggctcttct | 180 |
| gtcgagtacc | tgcagtggtt | ctcgcgcgtg | atgggcgcgc | acatccgggt | ccagttccag | 240 |
| ggtggcggtg | ctcatgggtt | ctacctgctc | gacggctctg | gtgcccagga | cgactacaac | 300 |
| ggctggggaca | tcaacacccc | tgcgttcgag | tgggttctacg | agtcgggctt | gtcgacgatc | 360 |
| atgccggtcg | gcggacagtc | cagcttctac | agcgactggg | accagccgtc | tgggggcaac | 420 |
| gggcagaact | acacctacaa | gtgggagacg | ttcctgaccc | aggagctgcc | gacgtggctg | 480 |
| gaggccaacc | gcggagtgtc | gcgcaccggc | aacgcgttcg | tgggcctgtc | gatggcgggc | 540 |

agcgcggcgc tgacctacgc gatccatcac cgcgagcagt tcacctacgc ctgcgtcgctg 600
 tcaggcttcc tgaacccgctc cgagggctgg tggccgatgc tgatcgggct ggcgatgaac 660
 gacgcaggcg gcttcaacgc cgagagcatg tggggcccg cctcggaacc ggcggtggaag 720
 cgcaacgacc cgatggtcaa catcaaccag ctggtggcca acaacacccg gatctggatc 780
 tactgcgga cgggcacccc gtcggagctg gacaccggga ccccgggcca gaacctgatg 840
 gccgcgcagt tcctcgaagg attcacgttg cggaccaaca tcgccttcgc tgacaactac 900
 atcgagccg ggcgcaccaa cgggtgtctt aacttcccgc cctcgggcac ccacagctgg 960
 ggggtactggg ggcagcagct gcagcagatg aagcccgaca tccagcgggt tctgggagct 1020
 caggccaccg cctagccacc caccacacac cc 1052

<210> 43
 <211> 326
 <212> PRT
 <213> Mycobacterium vaccae

<400> 43

Met Arg Leu Leu Asp Arg Ile Arg Gly Pro Trp Ala Arg Arg Phe Gly
 1 5 10 15
 Val Val Ala Val Ala Thr Ala Met Met Pro Ala Leu Val Gly Leu Ala
 20 25 30
 Gly Gly Ser Ala Thr Ala Gly Ala Phe Ser Arg Pro Gly Leu Pro Val
 35 40 45
 Glu Tyr Leu Met Val Pro Ser Pro Ser Met Gly Arg Asp Ile Lys Ile
 50 55 60
 Gln Phe Gln Ser Gly Gly Glu Asn Ser Pro Ala Leu Tyr Leu Leu Asp
 65 70 75 80
 Gly Leu Arg Ala Gln Glu Asp Phe Asn Gly Trp Asp Ile Asn Thr Gln
 85 90 95
 Ala Phe Glu Trp Phe Leu Asp Ser Gly Ile Ser Val Val Met Pro Val
 100 105 110
 Gly Gly Gln Ser Ser Phe Tyr Thr Asp Trp Tyr Ala Pro Ala Arg Asn
 115 120 125
 Lys Gly Pro Thr Val Thr Tyr Lys Trp Glu Thr Phe Leu Thr Gln Glu
 130 135 140
 Leu Pro Gly Trp Leu Gln Ala Asn Arg Ala Val Lys Pro Thr Gly Ser
 145 150 155 160
 Gly Pro Val Gly Leu Ser Met Ala Gly Ser Ala Ala Leu Asn Leu Ala
 165 170 175
 Thr Trp His Pro Glu Gln Phe Ile Tyr Ala Gly Ser Met Ser Gly Phe
 180 185 190
 Leu Asn Pro Ser Glu Gly Trp Trp Pro Phe Leu Ile Asn Ile Ser Met
 195 200 205
 Gly Asp Ala Gly Gly Phe Lys Ala Asp Asp Met Trp Gly Lys Thr Glu
 210 215 220
 Gly Ile Pro Thr Ala Val Gly Gln Arg Asn Asp Pro Met Leu Asn Ile
 225 230 235 240
 Pro Thr Leu Val Ala Asn Asn Thr Arg Ile Trp Val Tyr Cys Gly Asn
 245 250 255
 Gly Gln Pro Thr Glu Leu Gly Gly Gly Asp Leu Pro Ala Thr Phe Leu
 260 265 270
 Glu Gly Leu Thr Ile Arg Thr Asn Glu Thr Phe Arg Asp Asn Tyr Ile
 275 280 285
 Ala Ala Gly Gly His Asn Gly Val Phe Asn Phe Pro Ala Asn Gly Thr
 290 295 300
 His Asn Trp Ala Tyr Trp Gly Arg Glu Leu Gln Ala Met Lys Pro Asp
 305 310 315 320
 Leu Gln Ala His Leu Leu

325

<210> 44
 <211> 161
 <212> PRT
 <213> Mycobacterium vaccae

<400> 44

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ser | Gly | Trp | Asp | Ile | Asn | Thr | Ala | Ala | Phe | Glu | Trp | Tyr | Val | Asp | Ser |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Gly | Leu | Ala | Val | Ile | Met | Pro | Val | Gly | Gly | Gln | Ser | Ser | Phe | Tyr | Ser |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Asp | Trp | Tyr | Ser | Pro | Ala | Cys | Gly | Lys | Ala | Gly | Cys | Gln | Thr | Tyr | Lys |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Trp | Glu | Thr | Phe | Leu | Thr | Gln | Glu | Leu | Pro | Ala | Tyr | Leu | Ala | Ala | Asn |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| Lys | Gly | Val | Asp | Pro | Asn | Arg | Asn | Ala | Ala | Val | Gly | Leu | Ser | Met | Ala |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Gly | Ser | Ala | Ala | Leu | Thr | Leu | Ala | Ile | Tyr | His | Pro | Gln | Gln | Phe | Gln |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Tyr | Ala | Gly | Ser | Leu | Ser | Gly | Tyr | Leu | Asn | Pro | Ser | Glu | Gly | Trp | Trp |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Pro | Met | Leu | Ile | Asn | Ile | Ser | Met | Gly | Asp | Ala | Gly | Gly | Tyr | Lys | Ala |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Asn | Asp | Met | Trp | Gly | Pro | Pro | Lys | Asp | Pro | Ser | Ser | Ala | Trp | Lys | Arg |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Asn | Asp | Pro | Met | Val | Asn | Ile | Gly | Lys | Leu | Val | Ala | Asn | Asn | Thr | Pro |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Leu | | | | | | | | | | | | | | | |

<210> 45
 <211> 334
 <212> PRT
 <213> Mycobacterium vaccae

<400> 45

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Lys | Phe | Thr | Glu | Lys | Trp | Arg | Gly | Ser | Ala | Lys | Ala | Ala | Met | His |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Arg | Val | Gly | Val | Ala | Asp | Met | Ala | Ala | Val | Ala | Leu | Pro | Gly | Leu | Ile |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Gly | Phe | Ala | Gly | Gly | Ser | Ala | Thr | Ala | Gly | Ala | Phe | Ser | Arg | Pro | Gly |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Leu | Pro | Val | Glu | Tyr | Leu | Asp | Val | Phe | Ser | Pro | Ser | Met | Gly | Arg | Asp |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| Ile | Arg | Val | Gln | Phe | Gln | Gly | Gly | Gly | Thr | His | Ala | Val | Tyr | Leu | Leu |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Asp | Gly | Leu | Arg | Ala | Gln | Asp | Asp | Tyr | Asn | Gly | Trp | Asp | Ile | Asn | Thr |
| | | | 85 | | | | | 90 | | | | | 95 | | |
| Pro | Ala | Phe | Glu | Trp | Phe | Tyr | Glu | Ser | Gly | Leu | Ser | Thr | Ile | Met | Pro |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Val | Gly | Gly | Gln | Ser | Ser | Phe | Tyr | Ser | Asp | Trp | Tyr | Gln | Pro | Ser | Arg |
| | | 115 | | | | | | 120 | | | | 125 | | | |
| Gly | Asn | Gly | Gln | Asn | Tyr | Thr | Tyr | Lys | Trp | Glu | Thr | Phe | Leu | Thr | Gln |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Glu | Leu | Pro | Thr | Trp | Leu | Glu | Ala | Asn | Arg | Gly | Val | Ser | Arg | Thr | Gly |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |

Asn Ala Phe Val Gly Leu Ser Met Ala Gly Ser Ala Ala Leu Thr Tyr
 165 170 175
 Ala Ile His His Pro Gln Gln Phe Ile Tyr Ala Ser Ser Leu Ser Gly
 180 185 190
 Phe Leu Asn Pro Ser Glu Gly Trp Trp Pro Met Leu Ile Gly Leu Ala
 195 200 205
 Met Asn Asp Ala Gly Gly Phe Asn Ala Glu Ser Met Trp Gly Pro Ser
 210 215 220
 Ser Asp Pro Ala Trp Lys Arg Asn Asp Pro Met Val Asn Ile Asn Gln
 225 230 235 240
 Leu Val Ala Asn Asn Thr Arg Ile Trp Ile Tyr Cys Gly Thr Gly Thr
 245 250 255
 Pro Ser Glu Leu Asp Thr Gly Thr Pro Gly Gln Asn Leu Met Ala Ala
 260 265 270
 Gln Phe Leu Glu Gly Phe Thr Leu Arg Thr Asn Ile Ala Phe Arg Asp
 275 280 285
 Asn Tyr Ile Ala Ala Gly Gly Thr Asn Gly Val Phe Asn Phe Pro Ala
 290 295 300
 Ser Gly Thr His Ser Trp Gly Tyr Trp Gly Gln Gln Leu Gln Gln Met
 305 310 315 320
 Lys Pro Asp Ile Gln Arg Val Leu Gly Ala Gln Ala Thr Ala
 325 330

<210> 46
 <211> 795
 <212> DNA
 <213> Mycobacterium vaccae

<400> 46

| | | | | | | |
|-------------|-------------|------------|-------------|------------|------------|-----|
| ctgccgcggg | tttgccatct | cttgggtcct | gggtcgggag | gccatgttct | gggtaacgat | 60 |
| ccggtaccgt | ccggcgatgt | gaccaacatg | cgaacagcga | caacgaagct | aggagcggcg | 120 |
| ctcggcgag | cagcattggt | ggccgccacg | gggatggtca | gcgcggcgac | ggcgaacgcc | 180 |
| caggaagggc | accaggtccg | ttacacgctc | acctcgggccg | gcgcttacga | gttcgacctg | 240 |
| ttctatctga | cgacgcagcc | gccgagcatg | caggcggttca | acgccgacgc | gtatgcgttc | 300 |
| gccaaagcggg | agaagggtcag | cctcgccccg | ggtgtgccgt | gggtcttcga | aaccacgatg | 360 |
| gccgacccca | actgggcatg | ccttcaggtc | agcagcacca | cccgcggtgg | gcaggccgcc | 420 |
| ccgaacgcgc | actgcgacat | cgccgtcgat | ggccaggagg | tgctcagcca | gcacgacgac | 480 |
| ccctacaacg | tgcggtgcc | gctcggtcag | tggtgagtca | cctcgccgag | agtcggcca | 540 |
| gcgcccggcg | cagcggctcg | cggtgcagca | ccccaggcg | ctgggtcgcg | cgggtcagcg | 600 |
| cgacgtaaag | atcgctggcc | ccgcgcggcc | cctcggcgag | gatctgctcc | gggtagacca | 660 |
| ccagcacggc | gtctaactcc | agacccttgg | tctgcgtggg | tgccaccgcg | cccgggacac | 720 |
| cgggcggggc | gatcaccacg | ctggtgccct | cccgtccgc | ctccgcacgc | acgaaatcgt | 780 |
| cgatggcacc | ggcga | | | | | 795 |

<210> 47
 <211> 142
 <212> PRT
 <213> Mycobacterium vaccae

<400> 47

| | |
|---|--|
| Met Arg Thr Ala Thr Lys Leu Gly Ala Ala Leu Gly Ala Ala Ala | |
| 1 5 10 15 | |
| Leu Val Ala Ala Thr Gly Met Val Ser Ala Ala Thr Ala Asn Ala Gln | |
| 20 25 30 | |
| Glu Gly His Gln Val Arg Tyr Thr Leu Thr Ser Ala Gly Ala Tyr Glu | |
| 35 40 45 | |
| Phe Asp Leu Phe Tyr Leu Thr Thr Gln Pro Pro Ser Met Gln Ala Phe | |

| | | | | |
|---|-----|----|-----|-----|
| 50 | | 55 | | 60 |
| Asn Ala Asp Ala Tyr Ala Phe Ala Lys Arg Glu Lys Val Ser Leu Ala | | | | |
| 65 | | 70 | | 80 |
| Pro Gly Val Pro Trp Val Phe Glu Thr Thr Met Ala Asp Pro Asn Trp | | | | |
| | 85 | | 90 | 95 |
| Ala Ile Leu Gln Val Ser Ser Thr Thr Arg Gly Gly Gln Ala Ala Pro | | | | |
| | 100 | | 105 | 110 |
| Asn Ala His Cys Asp Ile Ala Val Asp Gly Gln Glu Val Leu Ser Gln | | | | |
| | 115 | | 120 | 125 |
| His Asp Asp Pro Tyr Asn Val Arg Cys Gln Leu Gly Gln Trp | | | | |
| | 130 | | 135 | 140 |

<210> 48
 <211> 300
 <212> DNA
 <213> Mycobacterium vaccae

| | |
|--|-----|
| <400> 48 | |
| gccagtgcgc caacgggtttt catcgatgcc gcacacaacc ccggtggggc ctgcgcttgc | 60 |
| cgaaggctgc gcgacgagtt cgacttcggg tatctcgtcg gcgtcgtctc ggtgatgggg | 120 |
| gacaaggacg tggacgggat ccgccaggac ccgggcgtgc cggacggggc cggctctcgca | 180 |
| ctgttcgtct cgggcgacaa ccttcgaaag ggtgcggcgc tcaacacgat ccagatcgcc | 240 |
| gagctgctgg ccgcccagtt gtaagtgttc cgccgaaatt gcattccacg ccgataatcg | 300 |

<210> 49
 <211> 563
 <212> DNA
 <213> Mycobacterium vaccae

| | |
|--|-----|
| <400> 49 | |
| ggatcctcgg ccggtctcaag agtccgcgcc gaggtggatg tgacgctgga cggctacgag | 60 |
| ttcagtcggg cctgcgaggg gctgtaccac ttcgcctggg acgagttctg cgactgggtat | 120 |
| gtcagagctg ccaaagtgc actgggtgaa ggtttctcgc acaccacggc cgtgttggcc | 180 |
| accgtgctcg atgtgctgct caagcttctg caccgggtca tgccgttcgt caccgaggtg | 240 |
| ctgtggaagg ccctgacggg gcggggccggc gcgagcgaac gtctgggaaa tgtggagtca | 300 |
| ctggctcgtc cggactggcc caccgccacc ggatacgcgc tggatcaggc tgccgcacaa | 360 |
| cggatcgccg acacccagaa gttgatcacc gaggtgcgcc ggttccgcag cgatcagggt | 420 |
| ctggccgacc gccagcgggt gcctgccggg ttgtccggca tcgacaccgc gggctctggac | 480 |
| gcccattgtc cggcgggtgc cgcgctggcc ttgcttgacc gaggggtgat agggcttcac | 540 |
| cgcgtccgaa tcggtcgagg tgc | 563 |

<210> 50
 <211> 434
 <212> DNA
 <213> Mycobacterium vaccae

| | |
|--|-----|
| <400> 50 | |
| gggcccgggc cgaggatgag caagttcgaa gtcgtcaccg ggatggcggt cgcggttttc | 60 |
| gccgacgcgc ccatcgacgt cgccgtcgtc gaggtcgggc tcgggtggctg ctgggacgcg | 120 |
| acgaacgtgg tgaacgcacc ggtcgcggtc atcaccocga tcgggggtgga ccacaccgac | 180 |
| tacctcgggt acacgatcgc cgagatcgcc ggggagaagg ccggaaatca taccocgcca | 240 |
| gccgacgacc tgggtgcogac cgacaccgtc gccgtgctgg cgcggcaggt tcccagggcc | 300 |
| atggaggtgc tgctggccca ggcggtgcgc tcggtatgcg ctgtagcgcg cgaggattcg | 360 |
| gagtgcgcgg tgctgggccc tcaggtcgcc atcggcggca gctgctccgg ttgcaggggc | 420 |
| tcgggtggcgt ctac | 434 |

<210> 51

<211> 438
 <212> DNA
 <213> Mycobacterium vaccae

<400> 51

```

ggatccact cccgcgccg cggcgccag ctggtacggc cattccagcg tgctgatcga      60
ggtcgacggc taccgcgtgc tggccgaccc ggtgtggagc aacagatggt cggcctcacg    120
ggcggtcgga cgcagcgca tgcacgacgt cccggtgccg ctggaggcgc ttcccgcgt      180
ggacgcggtg gtgatcgcca acgaccacta cgaccacctc gacatcgaca ccatcgtcgc    240
gttggcgcac acccageggg ccccgttcgt ggtgccgttg ggcacggcg cacacctgcg    300
caagtggggc gtccccgagg cgcggatcgt cgagttggac tggcacgaag cccaccgcat    360
cgacgacctg acgtgtgtct gcacccccgc ccggcaacttc tccggccggt tgttctcccg    420
cgactcgacg ctgtggggc                                     438
  
```

<210> 52
 <211> 87
 <212> PRT
 <213> Mycobacterium vaccae

<400> 52

```

Ala Ser Ala Pro Thr Val Phe Ile Asp Ala Ala His Asn Pro Gly Gly
 1           5           10           15
Pro Cys Ala Cys Arg Arg Leu Arg Asp Glu Phe Asp Phe Arg Tyr Leu
 20           25           30
Val Gly Val Val Ser Val Met Gly Asp Lys Asp Val Asp Gly Ile Arg
 35           40           45
Gln Asp Pro Gly Val Pro Asp Gly Arg Gly Leu Ala Leu Phe Val Ser
 50           55           60
Gly Asp Asn Leu Arg Lys Gly Ala Ala Leu Asn Thr Ile Gln Ile Ala
 65           70           75           80
Glu Leu Leu Ala Ala Gln Leu
 85
  
```

<210> 53
 <211> 175
 <212> PRT
 <213> Mycobacterium vaccae

<400> 53

```

Gly Ser Ser Ala Gly Ser Arg Val Arg Ala Glu Val Asp Val Thr Leu
 1           5           10           15
Asp Gly Tyr Glu Phe Ser Arg Ala Cys Glu Ala Leu Tyr His Phe Ala
 20           25           30
Trp Asp Glu Phe Cys Asp Trp Tyr Val Glu Leu Ala Lys Val Gln Leu
 35           40           45
Gly Glu Gly Phe Ser His Thr Thr Ala Val Leu Ala Thr Val Leu Asp
 50           55           60
Val Leu Leu Lys Leu Leu His Pro Val Met Pro Phe Val Thr Glu Val
 65           70           75           80
Leu Trp Lys Ala Leu Thr Gly Arg Ala Gly Ala Ser Glu Arg Leu Gly
 85           90           95
Asn Val Glu Ser Leu Val Val Ala Asp Trp Pro Thr Pro Thr Gly Tyr
 100          105          110
Ala Leu Asp Gln Ala Ala Ala Gln Arg Ile Ala Asp Thr Gln Lys Leu
 115          120          125
Ile Thr Glu Val Arg Arg Phe Arg Ser Asp Gln Gly Leu Ala Asp Arg
 130          135          140
  
```

Gln Arg Val Pro Ala Arg Leu Ser Gly Ile Asp Thr Ala Gly Leu Asp
 145 150 155 160
 Ala His Val Pro Ala Val Arg Ala Leu Ala Trp Leu Asp Arg Gly
 165 170 175

<210> 54
 <211> 144
 <212> PRT
 <213> Mycobacterium vaccae

<400> 54
 Gly Pro Gly Pro Arg Asn Ser Lys Phe Glu Val Val Thr Gly Met Ala
 1 5 10 15
 Phe Ala Ala Phe Ala Asp Ala Pro Ile Asp Val Ala Val Val Glu Val
 20 25 30
 Gly Leu Gly Gly Arg Trp Asp Ala Thr Asn Val Val Asn Ala Pro Val
 35 40 45
 Ala Val Ile Thr Pro Ile Gly Val Asp His Thr Asp Tyr Leu Gly Asp
 50 55 60
 Thr Ile Ala Glu Ile Ala Gly Glu Lys Ala Gly Asn His His Pro Pro
 65 70 75 80
 Ala Asp Asp Leu Val Pro Thr Asp Thr Val Ala Val Leu Ala Arg Gln
 85 90 95
 Val Pro Glu Ala Asn Glu Val Leu Leu Ala Gln Ala Val Arg Ser Asp
 100 105 110
 Ala Ala Val Ala Arg Glu Asp Ser Glu Cys Ala Val Leu Gly Arg Gln
 115 120 125
 Val Ala Ile Gly Gly Ser Cys Ser Gly Cys Arg Gly Ser Val Ala Ser
 130 135 140

<210> 55
 <211> 145
 <212> PRT
 <213> Mycobacterium vaccae

<400> 55
 Asp Pro Thr Pro Ala Pro Ala Ala Ala Ser Trp Tyr Gly His Ser Ser
 1 5 10 15
 Val Leu Ile Glu Val Asp Gly Tyr Arg Val Leu Ala Asp Pro Val Trp
 20 25 30
 Ser Asn Arg Cys Ser Pro Ser Arg Ala Val Gly Pro Gln Arg Met His
 35 40 45
 Asp Val Pro Val Pro Leu Glu Ala Leu Pro Ala Val Asp Ala Val Val
 50 55 60
 Ile Ser Asn Asp His Tyr Asp His Leu Asp Ile Asp Thr Ile Val Ala
 65 70 75 80
 Leu Ala His Thr Gln Arg Ala Pro Phe Val Val Pro Leu Gly Ile Gly
 85 90 95
 Ala His Leu Arg Lys Trp Gly Val Pro Glu Ala Arg Ile Val Glu Leu
 100 105 110
 Asp Trp His Glu Ala His Arg Ile Asp Asp Leu Thr Leu Val Cys Thr
 115 120 125
 Pro Ala Arg His Phe Ser Gly Arg Leu Phe Ser Arg Asp Ser Thr Leu
 130 135 140

Trp
 145

<210> 56
 <211> 10
 <212> PRT
 <213> Mycobacterium vaccae

 <220>
 <221> UNSURE
 <222> (1)...(1)
 <223> Residue can be either Gly, Ile, Leu or Val

 <221> UNSURE
 <222> (2)...(2)
 <223> Residue can be either Ile, Leu, Gly, or Ala

 <221> UNSURE
 <222> (5)...(5)

 <221> UNSURE
 <222> (9)...(9)

<400> 56
 Xaa Xaa Ala Pro Xaa Gly Asp Ala Xaa Arg
 1 5 10

<210> 57
 <211> 8
 <212> PRT
 <213> Mycobacterium vaccae

 <220>
 <221> UNSURE
 <222> (7)...(7)
 <223> Residue can be either Ile or Leu

<400> 57
 Pro Glu Ala Glu Ala Asn Xaa Arg
 1 5

<210> 58
 <211> 11
 <212> PRT
 <213> Mycobacterium vaccae

 <220>
 <221> UNSURE
 <222> (4)...(4)
 <223> Residue can be either Gln or Gly

 <221> UNSURE
 <222> (5)...(5)
 <223> Residue can be either Gly or Gln

<400> 58
 Thr Ala Asn Xaa Xaa Glu Tyr Tyr Asp Asn Arg
 1 5 10

<210> 59

<211> 34
 <212> PRT
 <213> Mycobacterium vaccae

<400> 59
 Asn Ser Pro Arg Ala Glu Ala Glu Ala Asn Leu Arg Gly Tyr Phe Thr
 1 5 10 15
 Ala Asn Pro Ala Glu Tyr Tyr Asp Leu Arg Gly Ile Leu Ala Pro Ile
 20 25 30
 Gly Asp

<210> 60
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Made in a lab

<400> 60
 ccggtgggcc cgggctgcgc 20

<210> 61
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Made in a lab

<400> 61
 tggccggcca ccacgtggtg 20

<210> 62
 <211> 313
 <212> DNA
 <213> Mycobacterium vaccae

<400> 62
 gccggtgggc cgggctgcgc cggaatacgc ggcagccaat cccactgggc cggcctcggt 60
 gcaggggaatg tcgcaggacc cggtcgcggt ggcggcctcg aacaatccgg agttgacaac 120
 gctgtacggc tgcaactgtcg ggccagctca atccgcaagt aaacctggtg gacaccctca 180
 acagcgggtca gtacacggtg ttgcaccga ccaacgcggc atttagcaag ctgccggcat 240
 ccacgatcga cgagctcaag accaattcgt cactgctgac cagcatcctg acctaccacg 300
 tgggtggccgc cca 313

<210> 63
 <211> 18
 <212> PRT
 <213> Mycobacterium vaccae

<220>
 <221> UNSURE
 <222> (7)...(17)

<400> 63

Glu Pro Ala Gly Pro Leu Pro Xaa Tyr Asn Glu Arg Leu His Thr Leu
 1 5 10 15
 Xaa Gln

<210> 64
 <211> 25
 <212> PRT
 <213> Mycobacterium vaccae

<220>
 <221> UNSURE
 <222> (21)...(21)

<400> 64
 Gly Leu Asp Asn Glu Leu Ser Leu Val Asp Gly Gln Gly Arg Thr Leu
 1 5 10 15
 Thr Val Gln Gln Xaa Asp Thr Phe Leu
 20 25

<210> 65
 <211> 26
 <212> PRT
 <213> Mycobacterium vaccae

<220>
 <221> UNSURE
 <222> (3)...(3)

<221> UNSURE
 <222> (21)...(22)

<221> UNSURE
 <222> (24)...(24)

<400> 65
 Asp Pro Xaa Pro Asp Ile Glu Val Glu Phe Ala Arg Gly Thr Gly Ala
 1 5 10 15
 Glu Pro Gly Leu Xaa Xaa Val Xaa Asp Ala
 20 25

<210> 66
 <211> 32
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Made in a lab

<400> 66
 accgccctcg agttctcccg gccaggtctg cc

32

<210> 67
 <211> 32
 <212> DNA
 <213> Artificial Sequence

<220>
<223> Made in a lab

<400> 67
aagcacgagc tcagtctctt ccacgcggac gt

32

<210> 68
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Made in a lab

<400> 68
catggatcca ttctcccggc ccggtcttcc

30

<210> 69
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> Made in a lab

<400> 69
tttgaattct aggcgggtggc ctgagc

26

<210> 70
<211> 161
<212> PRT
<213> Mycobacterium vaccae

<400> 70

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ser | Gly | Trp | Asp | Ile | Asn | Thr | Ala | Ala | Phe | Glu | Trp | Tyr | Val | Asp | Ser |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Gly | Leu | Ala | Val | Ile | Met | Pro | Val | Gly | Gly | Gln | Ser | Ser | Phe | Tyr | Ser |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Asp | Trp | Tyr | Ser | Pro | Ala | Cys | Gly | Lys | Ala | Gly | Cys | Gln | Thr | Tyr | Lys |
| | 35 | | | | | 40 | | | | | 45 | | | | |
| Trp | Glu | Thr | Phe | Leu | Thr | Gln | Glu | Leu | Pro | Ala | Tyr | Leu | Ala | Ala | Asn |
| | 50 | | | | 55 | | | | | 60 | | | | | |
| Lys | Gly | Val | Asp | Pro | Asn | Arg | Asn | Ala | Ala | Val | Gly | Leu | Ser | Met | Ala |
| 65 | | | | | 70 | | | | 75 | | | | | 80 | |
| Gly | Ser | Ala | Ala | Leu | Thr | Leu | Ala | Ile | Tyr | His | Pro | Gln | Gln | Phe | Gln |
| | | | 85 | | | | | 90 | | | | | 95 | | |
| Tyr | Ala | Gly | Ser | Leu | Ser | Gly | Tyr | Leu | Asn | Pro | Ser | Glu | Gly | Trp | Trp |
| | 100 | | | | | | 105 | | | | | 110 | | | |
| Pro | Met | Leu | Ile | Asn | Ile | Ser | Met | Gly | Asp | Ala | Gly | Gly | Tyr | Lys | Ala |
| | 115 | | | | | 120 | | | 125 | | | | | | |
| Asn | Asp | Met | Trp | Gly | Arg | Thr | Glu | Asp | Pro | Ser | Ser | Ala | Trp | Lys | Arg |
| | 130 | | | | 135 | | | | | 140 | | | | | |
| Asn | Asp | Pro | Met | Val | Asn | Ile | Gly | Lys | Leu | Val | Ala | Asn | Asn | Thr | Pro |
| 145 | | | | 150 | | | | | 155 | | | | | | 160 |
| Leu | | | | | | | | | | | | | | | |

<210> 71
 <211> 33
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Made in a lab

<400> 71
 gagagactcg agaacgcca ggaagggcac cag 33

<210> 72
 <211> 32
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Made in a lab

<400> 72
 gagagactcg agtgactcac cactgaccga gc 32

<210> 73
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Made in a lab

<221> unsure
 <222> (3)...(3)

<221> unsure
 <222> (6)...(6)

<221> unsure
 <222> (9)...(9)

<221> unsure
 <222> (15)...(15)

<400> 73
 ggngcngcnc argcngarcc 20

<210> 74
 <211> 825
 <212> DNA
 <213> Mycobacterium vaccae

<400> 74
 ttggatccca ctcccgcgcc ggccggcgcc agctggtacg gccattccag cgtgctgac 60
 gaggtcgacg gctaccgcgt gctggccgac ccggtgtgga gcaacagatg ttcgccctca 120
 cgggcggtcg gaccgcagcg catgcacgac gtcccgggtg cgctggaggc gcttcccgcc 180
 gtggacgcgg tgggtgatcag ccacgaccac tacgaccacc tcgacatcga caccatcgtc 240
 gcgttgggcg acacccagcg ggccccgttc gtggtgcccgt tgggcatcgg cgcacacctg 300
 cgcaagtggg gcgtccccga ggccgcgatc gtcgagttgg actggcacga agcccaccgc 360

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atagacgacc tgacgtggt ctgcaccccc gcccggcact tctccggacg gttgttctcc 420
cgcgactcga cgctgtgggc gtcgtgggtg gtcaccggct cgtcgcacaa ggcgttcttc 480
ggtggcgaca cgggatacac gaagagcttc gccgagatcg gcgacgagta cgggtccgttc 540
gatctgacct tgctgccgat cggggcctac catcccgct tgcgcgacat ccacatgaac 600
cccgaggagg cgggtgcgcgc ccatctggac ctgaccgagg tggacaacag cctgatggtg 660
cccattccact gggcgacatt ccgcctcgcc ccgcatccgt ggtccgagcc cgccgaacgc 720
ctgctgaccg ctgccgacgc cgagcgggta cgcttgaccg tgccgattcc cggtcagcgg 780
gtggaccocgg agtcgacgtt cgaccctggg tggcggttct gaacc 825

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<210> 75
<211> 273
<212> PRT
<213> Mycobacterium vaccae

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```

<400> 75
Leu Asp Pro Thr Pro Ala Pro Ala Ala Ser Trp Tyr Gly His Ser
1          5          10          15
Ser Val Leu Ile Glu Val Asp Gly Tyr Arg Val Leu Ala Asp Pro Val
20          25          30
Trp Ser Asn Arg Cys Ser Pro Ser Arg Ala Val Gly Pro Gln Arg Met
35          40          45
His Asp Val Pro Val Pro Leu Glu Ala Leu Pro Ala Val Asp Ala Val
50          55          60
Val Ile Ser His Asp His Tyr Asp His Leu Asp Ile Asp Thr Ile Val
65          70          75          80
Ala Leu Ala His Thr Gln Arg Ala Pro Phe Val Val Pro Leu Gly Ile
85          90          95
Gly Ala His Leu Arg Lys Trp Gly Val Pro Glu Ala Arg Ile Val Glu
100         105         110
Leu Asp Trp His Glu Ala His Arg Ile Asp Asp Leu Thr Leu Val Cys
115         120         125
Thr Pro Ala Arg His Phe Ser Gly Arg Leu Phe Ser Arg Asp Ser Thr
130         135         140
Leu Trp Ala Ser Trp Val Val Thr Gly Ser Ser His Lys Ala Phe Phe
145         150         155         160
Gly Gly Asp Thr Gly Tyr Thr Lys Ser Phe Ala Glu Ile Gly Asp Glu
165         170         175
Tyr Gly Pro Phe Asp Leu Thr Leu Leu Pro Ile Gly Ala Tyr His Pro
180         185         190
Ala Phe Ala Asp Ile His Met Asn Pro Glu Glu Ala Val Arg Ala His
195         200         205
Leu Asp Leu Thr Glu Val Asp Asn Ser Leu Met Val Pro Ile His Trp
210         215         220
Ala Thr Phe Arg Leu Ala Pro His Pro Trp Ser Glu Pro Ala Glu Arg
225         230         235         240
Leu Leu Thr Ala Ala Asp Ala Glu Arg Val Arg Leu Thr Val Pro Ile
245         250         255
Pro Gly Gln Arg Val Asp Pro Glu Ser Thr Phe Asp Pro Trp Trp Arg
260         265         270
Phe

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<210> 76
<211> 10
<212> PRT
<213> Mycobacterium vaccae

```

<400> 76

Ala Lys Thr Ile Ala Tyr Asp Glu Glu Ala
1 5 10

<210> 77

<211> 337

<212> DNA

<213> Mycobacterium vaccae

<400> 77

| | | | | | | |
|------------|-------------|-------------|------------|------------|------------|-----|
| gatccctaca | tcctgctggt | cagctccaag | gtgtcgaccg | tcaaggatct | gctcccgtg | 60 |
| ctggagaagg | tcattccaggc | cggcaagccg | ctgctgatca | tcgccgagga | cgtcgagggc | 120 |
| gaggccctgt | ccacgctggt | ggtcaacaag | atccgcggca | ccttcaagtc | cgtcgccgtc | 180 |
| aaggctccgg | gcttcgggtga | ccgccgcaag | gcgatgctgc | aggacatggc | catcctcacc | 240 |
| ggtggtcagg | tcgtcagcga | aagagtcggg | ctgtccctgg | agaccgccga | cgtctcgctg | 300 |
| ctgggccagg | cccgcgaagt | cgctcgtcacc | aaggaca | | | 337 |

<210> 78

<211> 112

<212> PRT

<213> Mycobacterium vaccae

<400> 78

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asp | Pro | Tyr | Ile | Leu | Leu | Val | Ser | Ser | Lys | Val | Ser | Thr | Val | Lys | Asp |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Leu | Leu | Pro | Leu | Leu | Glu | Lys | Val | Ile | Gln | Ala | Gly | Lys | Pro | Leu | Leu |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Ile | Ile | Ala | Glu | Asp | Val | Glu | Gly | Glu | Ala | Leu | Ser | Thr | Leu | Val | Val |
| | | 35 | | | | 40 | | | | | 45 | | | | |
| Asn | Lys | Ile | Arg | Gly | Thr | Phe | Lys | Ser | Val | Ala | Val | Lys | Ala | Pro | Gly |
| 50 | | | | | 55 | | | | | 60 | | | | | |
| Phe | Gly | Asp | Arg | Arg | Lys | Ala | Met | Leu | Gln | Asp | Met | Ala | Ile | Leu | Thr |
| 65 | | | | | 70 | | | | 75 | | | | | 80 | |
| Gly | Gly | Gln | Val | Val | Ser | Glu | Arg | Val | Gly | Leu | Ser | Leu | Glu | Thr | Ala |
| | | | 85 | | | | | 90 | | | | | 95 | | |
| Asp | Val | Ser | Leu | Leu | Gly | Gln | Ala | Arg | Lys | Val | Val | Val | Thr | Lys | Asp |
| | | | 100 | | | | | 105 | | | | | 110 | | |

<210> 79

<211> 360

<212> DNA

<213> Mycobacterium vaccae

<400> 79

| | | | | | | |
|------------|------------|------------|-------------|-------------|------------|-----|
| ccgtacgaga | agatcggcgc | tgagctggtc | aaagaggctcg | ccaagaagac | cgacgacgtc | 60 |
| gcgggcgacg | gcaccaccac | cgccaccgtg | ctcgctcagg | ctctgggttcg | cgaaggcctg | 120 |
| cgcaacgtcg | cagccggcgc | caaccgcgtc | ggcctcaagc | gtggcatcga | gaaggctgtc | 180 |
| gaggctgtca | cccagtcgct | gctgaagtcg | gccaaaggagg | tcgagaccaa | ggagcagatt | 240 |
| tctgccaccg | cggcgatctc | cgccggcgac | accagatcg | gcgagctcat | cgccgaggcc | 300 |
| atggacaagg | tcggcaacga | gggtgtcatc | accgtcgagg | agtcgaacac | cttcggcctg | 360 |

<210> 80

<211> 120

<212> PRT

<213> Mycobacterium vaccae

<400> 80

Pro Tyr Glu Lys Ile Gly Ala Glu Leu Val Lys Glu Val Ala Lys Lys
 1 5 10 15
 Thr Asp Asp Val Ala Gly Asp Gly Thr Thr Thr Ala Thr Val Leu Ala
 20 25 30
 Gln Ala Leu Val Arg Glu Gly Leu Arg Asn Val Ala Ala Gly Ala Asn
 35 40 45
 Pro Leu Gly Leu Lys Arg Gly Ile Glu Lys Ala Val Glu Ala Val Thr
 50 55 60
 Gln Ser Leu Leu Lys Ser Ala Lys Glu Val Glu Thr Lys Glu Gln Ile
 65 70 75 80
 Ser Ala Thr Ala Ala Ile Ser Ala Gly Asp Thr Gln Ile Gly Glu Leu
 85 90 95
 Ile Ala Glu Ala Met Asp Lys Val Gly Asn Glu Gly Val Ile Thr Val
 100 105 110
 Glu Glu Ser Asn Thr Phe Gly Leu
 115 120

<210> 81
 <211> 43
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Made in a lab

<400> 81
 actgacgctg aggagcgaaa gcgtggggag cgaacaggat tag 43

<210> 82
 <211> 43
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Made in a lab

<400> 82
 cgacaaggaa cttcgctacc ttaggaccgt catagttacg ggc 43

<210> 83
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Made in a lab

<400> 83
 aaaaaaaaaa aaaaaaaaaa 20

<210> 84
 <211> 31
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Made in a lab

<400> 84
ggaaggaagc ggccgctttt tttttttttt t 31

<210> 85
<211> 31
<212> DNA
<213> Artificial Sequence

<220>
<223> Made in a lab

<400> 85
gagagagagc ccgggcatgc tsctsctsct s 31

<210> 86
<211> 238
<212> DNA
<213> Mycobacterium vaccae

<400> 86
ctcgaatgaac cgctcggagc gctcgacctg aagctgcgcc acgtcatgca gttcgagctc 60
aagcgcattcc agcgggaggt cgggatcacg ttcattctacg tgaccacga ccaggaagag 120
gcgctcacga tgagtgaccg catcgcggtg atgaacgccg gcaacgtcga acagatcggc 180
agcccgaccg agatctacga ccgtcccgcg acggtgttcg tcgccagctt catcgaat 238

<210> 87
<211> 79
<212> PRT
<213> Mycobacterium vaccae

<400> 87
Leu Asp Glu Pro Leu Gly Ala Leu Asp Leu Lys Leu Arg His Val Met
1 5 10 15
Gln Phe Glu Leu Lys Arg Ile Gln Arg Glu Val Gly Ile Thr Phe Ile
20 25 30
Tyr Val Thr His Asp Gln Glu Glu Ala Leu Thr Met Ser Asp Arg Ile
35 40 45
Ala Val Met Asn Ala Gly Asn Val Glu Gln Ile Gly Ser Pro Thr Glu
50 55 60
Ile Tyr Asp Arg Pro Ala Thr Val Phe Val Ala Ser Phe Ile Glu
65 70 75

<210> 88
<211> 1518
<212> DNA
<213> Mycobacterium vaccae

<400> 88
cactcgccat ggggtgttaca atacccacc agttcctcga agtaaaccgaa cagaaccgtg 60
acatccagct gagaaaatat tcacagcgac gaagcccggc cgatgcctga tgggggtccgg 120
catcagtaca gcgcgctttc ctgcgcggat tctattgtcg agtccggggg gtgacgaagg 180
aatccattgt cgaaatgtaa attcggttgcg gaatcacttg cataggtccg tcagatccgc 240
gaagggtttac cccacagcca cgacggctgt ccccgaggag gacctgccct gaccggcaca 300
cacatcaccg ctgcagaacc tgcagaacag acggcggtatt ccgcggcacc gcccgaagggc 360
gcgcgggtga tcgagatcga ccatgtcacg aagcgcttcg gcgactacct ggccgtcgcg 420
gacgcagact tctccatcgc gcccggggag ttcttctcca tgctcggccc gtccgggtgt 480

```

gggaagacga ccacgttgcg catgatcgcg ggattcgaga ccccgactga aggggcgatc 540
cgctcgaag gcgcgcgacgt gtcgaggacc ccaccaaca agcgcaacgt caacacgggtg 600
ttccagcact acgcgctgtt cccgcacatg acggtctggg acaacgtcgc gtacggcccg 660
cgcagcaaga aactcggcaa aggcgaggtc cgcaagcgcg tcgacgagct gctggagatc 720
gtccggctga ccgaatttgc cgagcgcagg cccgcccagc tgtccggcgg gcagcagcag 780
cgggtggcgt tggcccgggc actggtgaac taccacagcg cgctgctgct cgatgaaccg 840
ctcggagcgc tcgacctgaa gctgcgccac gtcatgcagt tcgagctcaa gcgcatccag 900
cgggaggtcg ggatcacgtt catctacgtg acccacgacc aggaagaggc gtcacgatg 960
agtgaccgca tcgcggtgat gaacgccggc aacgtcgaac agatcggcag cccgaccgag 1020
atctacgacc gtcccgcgac ggtgttcgtc gccagcttca tcggacaggc caacctctgg 1080
gcgggcccgt gcaccggccg ctccaaccgc gattacgtcg agatcgacgt tctcggctcg 1140
acgtgaagg cacgcccggg cgagaccacg atcgagcccg gcgggcacgc caccctgatg 1200
gtcgtccgg aacgcatccg ggtcaccgcc ggctcccagg acgcccgcac cgggtgacgtc 1260
gctcgtgctc gtgccaccgt caccgacctg accttccaag gtccggtggt gcggtctctc 1320
ctggccgctc cggacgactc gaccgtgacg gccacgtcg gccccgagca ggatctgccg 1380
ctgctgcgcc ccggcgacga cgtgtacgtc agctgggcac cggaagcctc cctggtgctt 1440
cccggcgacg acatccccac caccgaggac ctogaagaga tgctcgacga ctctgagtc 1500
acgttcccc attgcoga 1518

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<210> 89
 <211> 376
 <212> PRT
 <213> Mycobacterium vaccae

<400> 89

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Val Ile Glu Ile Asp His Val Thr Lys Arg Phe Gly Asp Tyr Leu Ala
 1             5             10             15
Val Ala Asp Ala Asp Phe Ser Ile Ala Pro Gly Glu Phe Phe Ser Met
 20             25             30
Leu Gly Pro Ser Gly Cys Gly Lys Thr Thr Thr Leu Arg Met Ile Ala
 35             40             45
Gly Phe Glu Thr Pro Thr Glu Gly Ala Ile Arg Leu Glu Gly Ala Asp
 50             55             60
Val Ser Arg Thr Pro Pro Asn Lys Arg Asn Val Asn Thr Val Phe Gln
 65             70             75             80
His Tyr Ala Leu Phe Pro His Met Thr Val Trp Asp Asn Val Ala Tyr
 85             90             95
Gly Pro Arg Ser Lys Lys Leu Gly Lys Gly Glu Val Arg Lys Arg Val
 100            105            110
Asp Glu Leu Leu Glu Ile Val Arg Leu Thr Glu Phe Ala Glu Arg Arg
 115            120            125
Pro Ala Gln Leu Ser Gly Gly Gln Gln Gln Arg Val Ala Leu Ala Arg
 130            135            140
Ala Leu Val Asn Tyr Pro Ser Ala Leu Leu Leu Asp Glu Pro Leu Gly
 145            150            155            160
Ala Leu Asp Leu Lys Leu Arg His Val Met Gln Phe Glu Leu Lys Arg
 165            170            175
Ile Gln Arg Glu Val Gly Ile Thr Phe Ile Tyr Val Thr His Asp Gln
 180            185            190
Glu Glu Ala Leu Thr Met Ser Asp Arg Ile Ala Val Met Asn Ala Gly
 195            200            205
Asn Val Glu Gln Ile Gly Ser Pro Thr Glu Ile Tyr Asp Arg Pro Ala
 210            215            220
Thr Val Phe Val Ala Ser Phe Ile Gly Gln Ala Asn Leu Trp Ala Gly
 225            230            235            240
Arg Cys Thr Gly Arg Ser Asn Arg Asp Tyr Val Glu Ile Asp Val Leu
 245            250            255

```


<400> 93

```

ccccaccccc ttcctggag cgcacgaaag gaccccgac atgtcccggtg acatcgatcc    60
ccacctggtg gcccgaaatga ccgcacgccc cacccttgcgt cgcgcgttca tcggcggtgg    120
cgccgcggcc gcccggggccc tgaccctcgg ttcgtcgttc ctggcgggcgt gcggggtccga    180
cagtgggacc tcgagcacca cgtcacagga cagcgcccc gccagcggcg ccctgcgcgt    240
ctccaactgg ccgctctata tggccgacgg tttcatcgca gcgttccaga ccgcctcggg    300
catcacggtc gactacaaag aagacttcaa cgacaacgag cagtgggttcg ccaaggtcaa    360
ggagccggtg tcgcgcaagc aggacatagg cgcgcacctg gtgatcccca ccgagttcat    420
ggccgcgcgc gtcaagggcc tgggatggct caatgagatc agcgaagccg gcgtgccccaa    480
tcgcaagaat ctgcgtcagg acctgttgga ctgcagcatc gacgagggcc gcaagttcac    540
cgcgcggtac atgaccggca tggtcgggtct cgcctacaac aaggcagcca ccggacgcga    600
tatccgcacc atcgacgacc tctgggatcc cgcgttcaag ggccgcgtca gtctgtttctc    660
cgacgtccag gacggcctcg gcatgatcat gctctcgcag ggcaactcgc cggagaatcc    720
gaccaccgag tcatttcagc aggcggtcga tctggtccgc gaacagaacg acaggggggtc    780
agatccgtcg cttcaccggc aacgactacg ccgacgacct ggccgcagaa acatcgccat    840
cgcgcaggcg tactccggtg acgtcgtgca gctgcaggcg gacaaccccg atctgcagtt    900
catcgttccc gaatccggcg gcgactgggt cgtcgacacg atggtgatcc cgtacaccac    960
gcagaaccag aaggccgccc aggcgtggat cgactacatc tacgaccgag ccaactacgc   1020
caagctgggtc cgttcacccc agttcgtgcc cgcactctcg gacatgaccg acgaactcgc   1080
caaggtcgat cctgcatcgg cggagaaccc gctgatcaac ccgtcggccg aggtgcaggc   1140
gaacctgaag tcgtggggcg cactgaccga cgagcagacg caggagttca acactgcgta   1200
cgccgcggtc accggcgggt gacgcggtgg tagtgccgat gcgaggggca taaatggccc   1260
tgcgacgcgc agggagcataa atggccgggtg tcgccaccag cagccgtcag cggacaaggt   1320
cgctccgtat ctgatggtcc t                                     1341

```

<210> 94

<211> 393

<212> PRT

<213> Mycobacterium vaccae

<400> 94

```

Met Ser Arg Asp Ile Asp Pro His Leu Leu Ala Arg Met Thr Ala Arg
 1          5          10          15
Arg Thr Leu Arg Arg Phe Ile Gly Gly Ala Ala Ala Ala Ala
 20          25          30
Gly Leu Thr Leu Gly Ser Ser Phe Leu Ala Ala Cys Gly Ser Asp Ser
 35          40          45
Gly Thr Ser Ser Thr Thr Ser Gln Asp Ser Gly Pro Ala Ser Gly Ala
 50          55          60
Leu Arg Val Ser Asn Trp Pro Leu Tyr Met Ala Asp Gly Phe Ile Ala
 65          70          75          80
Ala Phe Gln Thr Ala Ser Gly Ile Thr Val Asp Tyr Lys Glu Asp Phe
 85          90          95
Asn Asp Asn Glu Gln Trp Phe Ala Lys Val Lys Glu Pro Leu Ser Arg
 100          105          110
Lys Gln Asp Ile Gly Ala Asp Leu Val Ile Pro Thr Glu Phe Met Ala
 115          120          125
Ala Arg Val Lys Gly Leu Gly Trp Leu Asn Glu Ile Ser Glu Ala Gly
 130          135          140
Val Pro Asn Arg Lys Asn Leu Arg Gln Asp Leu Leu Asp Ser Ser Ile
 145          150          155          160
Asp Glu Gly Arg Lys Phe Thr Ala Pro Tyr Met Thr Gly Met Val Gly
 165          170          175
Leu Ala Tyr Asn Lys Ala Ala Thr Gly Arg Asp Ile Arg Thr Ile Asp
 180          185          190
Asp Leu Trp Asp Pro Ala Phe Lys Gly Arg Val Ser Leu Phe Ser Asp
 195          200          205

```

Val Gln Asp Gly Leu Gly Met Ile Met Leu Ser Gln Gly Asn Ser Pro
 210 215 220
 Glu Asn Pro Thr Thr Glu Ser Ile Gln Gln Ala Val Asp Leu Val Arg
 225 230 235 240
 Glu Gln Asn Asp Arg Gly Ser Asp Pro Ser Leu His Arg Gln Arg Leu
 245 250 255
 Arg Arg Arg Pro Gly Arg Arg Asn Ile Ala Ile Ala Gln Ala Tyr Ser
 260 265 270
 Gly Asp Val Val Gln Leu Gln Ala Asp Asn Pro Asp Leu Gln Phe Ile
 275 280 285
 Val Pro Glu Ser Gly Gly Asp Trp Phe Val Asp Thr Met Val Ile Pro
 290 295 300
 Tyr Thr Thr Gln Asn Gln Lys Ala Ala Glu Ala Trp Ile Asp Tyr Ile
 305 310 315 320
 Tyr Asp Arg Ala Asn Tyr Ala Lys Leu Val Ala Phe Thr Gln Phe Val
 325 330 335
 Pro Ala Leu Ser Asp Met Thr Asp Glu Leu Ala Lys Val Asp Pro Ala
 340 345 350
 Ser Ala Glu Asn Pro Leu Ile Asn Pro Ser Ala Glu Val Gln Ala Asn
 355 360 365
 Leu Lys Ser Trp Ala Ala Leu Thr Asp Glu Gln Thr Gln Glu Phe Asn
 370 375 380
 Thr Ala Tyr Ala Ala Val Thr Gly Gly
 385 390

<210> 95
 <211> 22
 <212> DNA
 <213> Mycobacterium vaccae

<400> 95
 atgtcccggtg acatcgatcc cc 22

<210> 96
 <211> 21
 <212> DNA
 <213> Mycobacterium vaccae

<400> 96
 atcggcacta ccaccgcgtc a 21

<210> 97
 <211> 861
 <212> DNA
 <213> Mycobacterium vaccae

<400> 97
 gccggcgctc gcatatctcg cgatcttctt ccgtggtgcc gttcttctcg ctggcacgca 60
 cctcggtgtc ggagaccggc ggctcggtgt tcatgccgac gctgacgttc gcctgggact 120
 tcggcaacta cgtcgacgcg ttcacgatgt accacgagca gatcttccgc tcgttcggct 180
 acgcgttcgt cgccacggtg ctgtgcctgt tgcctggcgtt cccgctggcc tacgtcatcg 240
 cgttcaaggc cggccgggtt aagaacctga tccctggggct ggtgatcctg ccgttcttcg 300
 tcacgttctt gatccgcacc attgcgtgga agacgatcct ggccgacgaa ggctgggtgg 360
 tcaccgcgct gggcgccatc gggctgctgc ctgacgaggg ccggctgctg tccaccagct 420
 gggcggtcat cggcggtctg acctacaact ggatcatctt catgatcctg ccgctgtacg 480
 tcagcctgga gaagatcgac ccgcgtctgc tggaggcctc ccaggacctc tactcgtcgg 540
 cgccgcgcag cttcggcaag gtgatcctgc cgatggcgat gcccggggtg ctggccggga 600

```

gcatgctggt gttcatcccg gccgtcggcg acttcatcaa cgccgactat ctcggcagta 660
cccagaccac catgatcggc aacgtgatcc agaagcagtt cctggtcgtc aaggactatc 720
cggcggcggc cgcgctgagt ctggggctga tgttgctgat cctgatcggc gtgctcctct 780
acacacgggc gctgggttcg gaggatctgg tatgaccacc caggcaggcg ccgcactggc 840
caccgccgcc cagcaggatc c 861

```

<210> 98
 <211> 259
 <212> PRT
 <213> Mycobacterium vaccae

<400> 98

| | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Val | Val | Pro | Phe | Ser | Leu | Ala | Arg | Thr | Ser | Leu | Ser | Glu | Thr | Gly |
| 1 | | | 5 | | | | | 10 | | | | | 15 | |
| Gly | Ser | Val | Phe | Met | Pro | Thr | Leu | Thr | Phe | Ala | Trp | Asp | Phe | Gly |
| | | | 20 | | | | | 25 | | | | 30 | | Asn |
| Tyr | Val | Asp | Ala | Phe | Thr | Met | Tyr | His | Glu | Gln | Ile | Phe | Arg | Ser |
| | | 35 | | | | | 40 | | | | | 45 | | Phe |
| Gly | Tyr | Ala | Phe | Val | Ala | Thr | Val | Leu | Cys | Leu | Leu | Leu | Ala | Phe |
| | 50 | | | | | 55 | | | | 60 | | | | Pro |
| Leu | Ala | Tyr | Val | Ile | Ala | Phe | Lys | Ala | Gly | Arg | Phe | Lys | Asn | Leu |
| 65 | | | | | 70 | | | | 75 | | | | | 80 |
| Leu | Gly | Leu | Val | Ile | Leu | Pro | Phe | Phe | Val | Thr | Phe | Leu | Ile | Arg |
| | | | 85 | | | | | 90 | | | | | 95 | Thr |
| Ile | Ala | Trp | Thr | Ile | Leu | Ala | Asp | Glu | Gly | Trp | Val | Val | Thr | Ala |
| | | | 100 | | | | | 105 | | | | 110 | | Leu |
| Gly | Ala | Ile | Gly | Leu | Leu | Pro | Asp | Glu | Gly | Arg | Leu | Leu | Ser | Thr |
| | 115 | | | | | 120 | | | | | 125 | | | Ser |
| Trp | Ala | Val | Ile | Gly | Gly | Leu | Thr | Tyr | Asn | Trp | Ile | Ile | Phe | Met |
| | 130 | | | | | 135 | | | | | 140 | | | Ile |
| Leu | Pro | Leu | Tyr | Val | Ser | Leu | Glu | Lys | Ile | Asp | Pro | Arg | Leu | Leu |
| 145 | | | | | 150 | | | | 155 | | | | | Glu |
| Ala | Ser | Gln | Asp | Leu | Tyr | Ser | Ser | Ala | Pro | Arg | Ser | Phe | Gly | Lys |
| | | | 165 | | | | | | 170 | | | | 175 | Val |
| Ile | Leu | Pro | Met | Ala | Met | Pro | Gly | Val | Leu | Ala | Gly | Ser | Met | Leu |
| | | 180 | | | | | | 185 | | | | 190 | | Val |
| Phe | Ile | Pro | Ala | Val | Gly | Asp | Phe | Ile | Asn | Ala | Asp | Tyr | Leu | Gly |
| | 195 | | | | | 200 | | | | | | 205 | | Ser |
| Thr | Gln | Thr | Thr | Met | Ile | Gly | Asn | Val | Ile | Gln | Lys | Gln | Phe | Leu |
| | 210 | | | | | 215 | | | | | 220 | | | Val |
| Val | Lys | Asp | Tyr | Pro | Ala | Ala | Ala | Ala | Leu | Ser | Leu | Gly | Leu | Met |
| 225 | | | | | 230 | | | | | 235 | | | | 240 |
| Leu | Ile | Leu | Ile | Gly | Val | Leu | Leu | Tyr | Thr | Arg | Ala | Leu | Gly | Ser |
| | | | 245 | | | | | 250 | | | | | 255 | Glu |
| Asp | Leu | Val | | | | | | | | | | | | |

<210> 99
 <211> 277
 <212> DNA
 <213> Mycobacterium vaccae

<400> 99

| | | | | | | |
|------------|------------|------------|------------|-------------|------------|-----|
| gtaatctttg | ctggagcccg | tacgccggta | ggcaaactca | tgggttcgct | caaggacttc | 60 |
| aagggcagcg | atctcggtgc | cgtggcgatc | aagggcgccc | tggagaaagc | cttccccggc | 120 |
| gtcgacgacc | ctgctcgtct | cgtcgagtac | gtgatcatgg | gccaagtgct | ctccgccggc | 180 |
| gccggccaga | tgcccgcccg | ccaggccgcc | gtcgccgcgc | gcaccccgctg | ggacgtcgcc | 240 |

tcgctgacga tcaacaagat gtgcctgtcg ggcacgcg

277

<210> 100
 <211> 92
 <212> PRT
 <213> Mycobacterium vaccae

<400> 100
 Val Ile Phe Ala Gly Ala Arg Thr Pro Val Gly Lys Leu Met Gly Ser
 1 5 10 15
 Leu Lys Asp Phe Lys Gly Ser Asp Leu Gly Ala Val Ala Ile Lys Gly
 20 25 30
 Ala Leu Glu Lys Ala Phe Pro Gly Val Asp Asp Pro Ala Arg Leu Val
 35 40 45
 Glu Tyr Val Ile Met Gly Gln Val Leu Ser Ala Gly Ala Gly Gln Met
 50 55 60
 Pro Ala Arg Gln Ala Ala Val Ala Ala Gly Ile Pro Trp Asp Val Ala
 65 70 75 80
 Ser Leu Thr Ile Asn Lys Met Cys Leu Ser Gly Ile
 85 90

<210> 101
 <211> 12
 <212> PRT
 <213> Mycobacterium vaccae

<220>
 <221> UNSURE
 <222> (1)...(1)
 <223> Residue can be either Glu or Pro

<221> UNSURE
 <222> (2)...(2)
 <223> Residue can be either Pro or Glu

<221> UNSURE
 <222> (7)...(7)

<221> UNSURE
 <222> (12)...(12)

<400> 101
 Xaa Xaa Ala Asp Arg Gly Xaa Ser Lys Tyr Arg Xaa
 1 5 10

<210> 102
 <211> 24
 <212> PRT
 <213> Mycobacterium vaccae

<220>
 <221> UNSURE
 <222> (1)...(1)

<400> 102
 Xaa Ile Asp Glu Ser Leu Phe Asp Ala Glu Glu Lys Met Glu Lys Ala
 1 5 10 15

| | | | | | | |
|------------|------------|------------|------------|------------|------------|-----|
| ctgtcgggct | acctgaaccc | gtccgagggg | tggtggccga | tgctgatcaa | catctcgatg | 360 |
| ggtgacgcgg | gcggtacaaa | ggccaacgac | atgtgggggc | gcaccgagga | cccgagcagc | 420 |
| gcttggaagc | gcaacgaccc | gatggtcaac | atcggcaagc | tggtcgccaa | caacaccccc | 480 |
| ctctc | | | | | | 485 |

<210> 107
 <211> 501
 <212> DNA
 <213> Mycobacterium vaccae

<220>
 <221> unsure
 <222> (441)...(441)

<221> unsure
 <222> (450)...(450)

| | | | | | | |
|------------|------------|------------|------------|------------|------------|-----|
| <400> 107 | | | | | | |
| atgccggtgc | gacgtgcgcg | cagtgcgctt | gcgtccgtga | ccttcgtcgc | ggccgcgtgc | 60 |
| gtgggcgctg | agggcaccgc | actggcgcg | acgcgggact | ggagcgggcg | ctacacggtg | 120 |
| gtgacgttcg | cctccgacaa | actcggcacg | agtgtggccg | cccgccagcc | agaaccgcac | 180 |
| ttcagcggtc | agtacacctt | cagcacgtcc | tgtgtgggca | cctgcgtggc | caccgcgtcc | 240 |
| gacggcccgg | cgcgctcgaa | cccgcagatt | ccgcagcccg | cgcgctacac | ctgggacggc | 300 |
| aggcagtggg | tgttcaacta | caactggcag | tgggagtgtt | tccgcggcgc | cgacgtcccg | 360 |
| cgcgagtacg | ccgcgcgcgc | ttcgttggtg | ttctacgccc | cgaccgccga | cgggtcgatg | 420 |
| ttcggcacct | ggcgcaccga | natcctggan | ggcctctgca | agggcaccgt | gatcatgccg | 480 |
| gtcgcggcct | atccggcgta | g | | | | 501 |

<210> 108
 <211> 180
 <212> DNA
 <213> Mycobacterium vaccae

| | | | | | | |
|------------|-------------|-------------|------------|------------|------------|-----|
| <400> 108 | | | | | | |
| atgaaccagc | cgcggccccga | ggccgaggcg | aacctgcggg | gctacttcac | cgccaacccg | 60 |
| gcggagtact | acgacctgcg | gggcattcctc | gccccgatcg | gtgacgcgca | gcgcaactgc | 120 |
| aacatcaccg | tgctgcgggt | agagctgcag | acggcctacg | acacgttcat | ggccgggtga | 180 |

<210> 109
 <211> 166
 <212> PRT
 <213> Mycobacterium vaccae

| | | | | | | | | | | | | | | | |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| <400> 109 | | | | | | | | | | | | | | | |
| Met | Pro | Val | Arg | Arg | Ala | Arg | Ser | Ala | Leu | Ala | Ser | Val | Thr | Phe | Val |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Ala | Ala | Ala | Cys | Val | Gly | Ala | Glu | Gly | Thr | Ala | Leu | Ala | Ala | Thr | Pro |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Asp | Trp | Ser | Gly | Arg | Tyr | Thr | Val | Val | Thr | Phe | Ala | Ser | Asp | Lys | Leu |
| | | 35 | | | | 40 | | | | | | 45 | | | |
| Gly | Thr | Ser | Val | Ala | Ala | Arg | Gln | Pro | Glu | Pro | Asp | Phe | Ser | Gly | Gln |
| | 50 | | | | 55 | | | | | 60 | | | | | |
| Tyr | Thr | Phe | Ser | Thr | Ser | Cys | Val | Gly | Thr | Cys | Val | Ala | Thr | Ala | Ser |
| 65 | | | | | 70 | | | | 75 | | | | | 80 | |
| Asp | Gly | Pro | Ala | Pro | Ser | Asn | Pro | Thr | Ile | Pro | Gln | Pro | Ala | Arg | Tyr |
| | | | 85 | | | | | 90 | | | | | 95 | | |
| Thr | Trp | Asp | Gly | Arg | Gln | Trp | Val | Phe | Asn | Tyr | Asn | Trp | Gln | Trp | Glu |

100 105 110
 Cys Phe Arg Gly Ala Asp Val Pro Arg Glu Tyr Ala Ala Ala Arg Ser
 115 120 125
 Leu Val Phe Tyr Ala Pro Thr Ala Asp Gly Ser Met Phe Gly Thr Trp
 130 135 140
 Arg Thr Asp Ile Leu Asp Gly Leu Cys Lys Gly Thr Val Ile Met Pro
 145 150 155 160
 Val Ala Ala Tyr Pro Ala
 165

<210> 110
 <211> 74
 <212> PRT
 <213> Mycobacterium vaccae

<400> 110
 Pro Arg Asp Thr His Pro Gly Ala Asn Gln Ala Val Thr Ala Ala Met
 1 5 10 15
 Asn Gln Pro Arg Pro Glu Ala Glu Ala Asn Leu Arg Gly Tyr Phe Thr
 20 25 30
 Ala Asn Pro Ala Glu Tyr Tyr Asp Leu Arg Gly Ile Leu Ala Pro Ile
 35 40 45
 Gly Asp Ala Gln Arg Asn Cys Asn Ile Thr Val Leu Pro Val Glu Leu
 50 55 60
 Gln Thr Ala Tyr Asp Thr Phe Met Ala Gly
 65 70

<210> 111
 <211> 503
 <212> DNA
 <213> Mycobacterium vaccae

<220>
 <221> unsure
 <222> (358)...(358)

<400> 111
 atgcaggtgc ggcgtgttct ggcagtgct ggtgcagcag tcgcggtttc ggccgcgtta 60
 tggcagacgg gggtttcgat accgaccgcc tcagcggatc cgtgtccgga catcgagggtg 120
 atcttcgcgc gcgggaccgg tgcggaaccc ggccctcgggt gggtcggtga tgcgttcgctc 180
 aacgcgctgc ggcccaaggt cggtagcag tcgggtgggca cctacgcggt gaactaccgc 240
 gcaggattcg gacttcgaca aatcggcgcc catgggcgcg gccgacgcat cggggcggggt 300
 gcagtggatg gccgacaact gcccgacac caagcttgct ctgggcggca tgtcgcangg 360
 cgccggcgctc atcgacctga tcaccgtcga tccgcgaccg ctgggcccgt tcacccccac 420
 cccgatgccg ccccgcgctc ccgaccacgt ggccgcccgt gtggtcttcg gaaatccgtt 480
 gcgcgacatc cgtgggtggcg gtc 503

<210> 112
 <211> 167
 <212> PRT
 <213> Mycobacterium vaccae

<220>
 <221> UNSURE
 <222> (119)...(119)

<400> 112


```

Met Gln Val Arg Arg Val Leu Gly Ser Val Gly Ala Ala Val Ala Val
 1           5           10          15
Ser Ala Ala Leu Trp Gln Thr Gly Val Ser Ile Pro Thr Ala Ser Ala
 20          25          30
Asp Pro Cys Pro Asp Ile Glu Val Ile Phe Ala Arg Gly Thr Gly Ala
 35          40          45
Glu Pro Gly Leu Gly Trp Val Gly Asp Ala Phe Val Asn Ala Leu Arg
 50          55          60
Pro Lys Val Gly Glu Gln Ser Val Gly Thr Tyr Ala Val Asn Tyr Pro
 65          70          75          80
Ala Gly Phe Asp Phe Asp Lys Ser Ala Pro Met Gly Ala Ala Asp Ala
 85          90          95
Ser Gly Arg Val Gln Trp Met Ala Asp Asn Cys Pro Asp Thr Lys Leu
100         105         110
Val Leu Gly Gly Met Ser Xaa Gly Ala Gly Val Ile Asp Leu Ile Thr
115         120         125
Val Asp Pro Arg Pro Leu Gly Arg Phe Thr Pro Thr Pro Met Pro Pro
130         135         140
Arg Val Ala Asp His Val Ala Ala Val Val Val Phe Gly Asn Pro Leu
145         150         155         160
Arg Asp Ile Arg Gly Gly Gly
165

```

```

<210> 113
<211> 1569
<212> DNA
<213> Mycobacterium vaccae

```

<400> 113

```

atggccaaga caattgcgta tgacgaagag gcccgccgtg gcctcgagcg gggcctcaac      60
gccctcgagc acgccgtaaa ggtgacgttg ggcccggaagg gtcgcaacgt cgtgctggag      120
aagaagtggg ggcgccccac gatcaccaac gatggtgtgt ccatcgccaa ggagatcgag      180
ctggaggacc cgtacgagaa gatcggcgct gagctggtca aagaggtcgc caagaagacc      240
gacgacgtcg cgggcgacgg caccaccacc gccaccgtgc tcgctcaggc tctggttcgc      300
gaaggcctgc gcaacgtcgc agccggcgcc aaccgcgtcg gcctcaagcg tggcatcgag      360
aaggctgtcg aggtgtcac ccagtcgtcg ctgaagtcgg ccaaggaggt cgagaccaag      420
gagcagattt ctgccaccgc ggcgatttcc gccggcgaca cccagatcgg cgagctcatc      480
gccgaggcca tggacaaggt cggcaacgag ggtgtcatca ccgtcgagga gtcgaacacc      540
ttcggcctgc agctcgagct caccgagggt atgcgcttcg acaagggtta catctcgggt      600
tacttcgtga ccgacgccga gcgccaggaa gccgtccttg aggatcccta catcctgctg      660
gtcagctcca aggtgtcgac cgtcaaggat ctgctcccgc tgctggagaa ggtcatccag      720
gccggcaagc cgctgctgat catcgccgag gacgtcgagg gcgaggccct gtccacgctg      780
gtggtcaaca agatccgcgg caccttcaag tccgtcgccg tcaaggctcc gggcttcggg      840
gaccgccgca aggcgatgct gcaggacatg gccatcctca ccggtggtca ggtcgtcagc      900
gaaagagtcg ggctgtccct ggagaccgcc gacgtctcgc tgctgggcca ggcccgcaag      960
gtcgctcgta ccaaggacga gaccaccatc gtcgaggggt cgggcgattc cgatgccatc     1020
gccggccggg tggtcagat ccgcgccgag atcgagaaca gcgactccga ctacgaccgc     1080
gagaagctgc aggagcgctt ggccaagctg gccggcggtg ttgcggtgat caaggccgga     1140
gctgccaccg aggtggagct caaggagcgc aagcaccgca tcgaggacgc cgtccgcaac     1200
gcgaaggctg ccgtcgaaga gggcatcgtc gccggtggcg gcgtggctct gctgcagtcg     1260
gctcctgcgc tggacgacct cggcctgacg ggcgacgagg ccaccggtgc caacatcgtc     1320
cgcgtggcgc tgtcggctcc gctcaagcac atcgcttca acggcggcct ggagcccggc     1380
gtcggtgcgg agaaggtgtc caactgccc gccgggtcac gcctcaacgc cgcgaccggt     1440
gagtacgagg acctgctcaa ggccggcgtc gccgaccggg tgaaggtcac ccgctcggcg     1500
ctgcagaacg cggcgctccat cgcggctctg ttctcacca ccgaggccgt cgtcgccgac     1560
aagccggag
1569

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<210> 114
 <211> 523
 <212> PRT
 <213> Mycobacterium vaccae

<400> 114

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Ala | Lys | Thr | Ile | Ala | Tyr | Asp | Glu | Glu | Ala | Arg | Arg | Gly | Leu | Glu |
| 1 | | | | 5 | | | | 10 | | | | | 15 | | |
| Arg | Gly | Leu | Asn | Ala | Leu | Ala | Asp | Ala | Val | Lys | Val | Thr | Leu | Gly | Pro |
| | | 20 | | | | | 25 | | | | | | 30 | | |
| Lys | Gly | Arg | Asn | Val | Val | Leu | Glu | Lys | Lys | Trp | Gly | Ala | Pro | Thr | Ile |
| | 35 | | | | | 40 | | | | | 45 | | | | |
| Thr | Asn | Asp | Gly | Val | Ser | Ile | Ala | Lys | Glu | Ile | Glu | Leu | Glu | Asp | Pro |
| 50 | | | | | 55 | | | | | 60 | | | | | |
| Tyr | Glu | Lys | Ile | Gly | Ala | Glu | Leu | Val | Lys | Glu | Val | Ala | Lys | Lys | Thr |
| 65 | | | 70 | | | | | | 75 | | | | | 80 | |
| Asp | Asp | Val | Ala | Gly | Asp | Gly | Thr | Thr | Thr | Ala | Thr | Val | Leu | Ala | Gln |
| | | | 85 | | | | | 90 | | | | | 95 | | |
| Ala | Leu | Val | Arg | Glu | Gly | Leu | Arg | Asn | Val | Ala | Ala | Gly | Ala | Asn | Pro |
| | | 100 | | | | | | 105 | | | | | 110 | | |
| Leu | Gly | Leu | Lys | Arg | Gly | Ile | Glu | Lys | Ala | Val | Glu | Ala | Val | Thr | Gln |
| | 115 | | | | | | 120 | | | | | | 125 | | |
| Ser | Leu | Leu | Lys | Ser | Ala | Lys | Glu | Val | Glu | Thr | Lys | Glu | Gln | Ile | Ser |
| 130 | | | | | | 135 | | | | | 140 | | | | |
| Ala | Thr | Ala | Ala | Ile | Ser | Ala | Gly | Asp | Thr | Gln | Ile | Gly | Glu | Leu | Ile |
| 145 | | | | 150 | | | | | 155 | | | | | 160 | |
| Ala | Glu | Ala | Met | Asp | Lys | Val | Gly | Asn | Glu | Gly | Val | Ile | Thr | Val | Glu |
| | | | 165 | | | | | 170 | | | | | 175 | | |
| Glu | Ser | Asn | Thr | Phe | Gly | Leu | Gln | Leu | Glu | Leu | Thr | Glu | Gly | Met | Arg |
| | | 180 | | | | | | 185 | | | | | 190 | | |
| Phe | Asp | Lys | Gly | Tyr | Ile | Ser | Gly | Tyr | Phe | Val | Thr | Asp | Ala | Glu | Arg |
| | 195 | | | | | | 200 | | | | | 205 | | | |
| Gln | Glu | Ala | Val | Leu | Glu | Asp | Pro | Tyr | Ile | Leu | Leu | Val | Ser | Ser | Lys |
| 210 | | | | | | 215 | | | | | 220 | | | | |
| Val | Ser | Thr | Val | Lys | Asp | Leu | Leu | Pro | Leu | Leu | Glu | Lys | Val | Ile | Gln |
| 225 | | | | 230 | | | | | 235 | | | | | 240 | |
| Ala | Gly | Lys | Pro | Leu | Leu | Ile | Ile | Ala | Glu | Asp | Val | Glu | Gly | Glu | Ala |
| | | | 245 | | | | | 250 | | | | | 255 | | |
| Leu | Ser | Thr | Leu | Val | Val | Asn | Lys | Ile | Arg | Gly | Thr | Phe | Lys | Ser | Val |
| | | 260 | | | | | | 265 | | | | | 270 | | |
| Ala | Val | Lys | Ala | Pro | Gly | Phe | Gly | Asp | Arg | Arg | Lys | Ala | Met | Leu | Gln |
| | 275 | | | | | | 280 | | | | | 285 | | | |
| Asp | Met | Ala | Ile | Leu | Thr | Gly | Gly | Gln | Val | Val | Ser | Glu | Arg | Val | Gly |
| 290 | | | | | | 295 | | | | | 300 | | | | |
| Leu | Ser | Leu | Glu | Thr | Ala | Asp | Val | Ser | Leu | Leu | Gly | Gln | Ala | Arg | Lys |
| 305 | | | | | 310 | | | | | 315 | | | | 320 | |
| Val | Val | Val | Thr | Lys | Asp | Glu | Thr | Thr | Ile | Val | Glu | Gly | Ser | Gly | Asp |
| | | | 325 | | | | | 330 | | | | | 335 | | |
| Ser | Asp | Ala | Ile | Ala | Gly | Arg | Val | Ala | Gln | Ile | Arg | Ala | Glu | Ile | Glu |
| | | 340 | | | | | | 345 | | | | | 350 | | |
| Asn | Ser | Asp | Ser | Asp | Tyr | Asp | Arg | Glu | Lys | Leu | Gln | Glu | Arg | Leu | Ala |
| | | 355 | | | | | 360 | | | | | 365 | | | |
| Lys | Leu | Ala | Gly | Gly | Val | Ala | Val | Ile | Lys | Ala | Gly | Ala | Ala | Thr | Glu |
| 370 | | | | | | 375 | | | | | 380 | | | | |
| Val | Glu | Leu | Lys | Glu | Arg | Lys | His | Arg | Ile | Glu | Asp | Ala | Val | Arg | Asn |
| 385 | | | | 390 | | | | | | 395 | | | | 400 | |
| Ala | Lys | Ala | Ala | Val | Glu | Glu | Gly | Ile | Val | Ala | Gly | Gly | Gly | Val | Ala |

405 410 415
 Leu Leu Gln Ser Ala Pro Ala Leu Asp Asp Leu Gly Leu Thr Gly Asp
 420 425 430
 Glu Ala Thr Gly Ala Asn Ile Val Arg Val Ala Leu Ser Ala Pro Leu
 435 440 445
 Lys Gln Ile Ala Phe Asn Gly Gly Leu Glu Pro Gly Val Val Ala Glu
 450 455 460
 Lys Val Ser Asn Leu Pro Ala Gly His Gly Leu Asn Ala Ala Thr Gly
 465 470 475 480
 Glu Tyr Glu Asp Leu Leu Lys Ala Gly Val Ala Asp Pro Val Lys Val
 485 490 495
 Thr Arg Ser Ala Leu Gln Asn Ala Ala Ser Ile Ala Ala Leu Phe Leu
 500 505 510
 Thr Thr Glu Ala Val Val Ala Asp Lys Pro Glu
 515 520

<210> 115
 <211> 647
 <212> DNA
 <213> Mycobacterium vaccae

<400> 115

| | | | | | | |
|------------|------------|------------|------------|-------------|------------|-----|
| atggccaaga | caattgcgta | tgacgaagag | gcccgcctgt | gcctcgagcg | gggcctcaac | 60 |
| gcctcgagc | acgccgtaaa | ggtgacgttg | ggcccgaagg | gtcgcaacgt | cgtgctggag | 120 |
| aagaagtggg | gcgccccac | gatcaccaac | gatggtgtgt | ccatcgccaa | ggagatcgag | 180 |
| ctggaggacc | cgtacgagaa | gatcggcgt | gagctggtca | aagaggtcgc | caagaagacc | 240 |
| gacgacgtcg | cgggcgacgg | caccaccacc | gccaccgtgc | tcgctcaggc | tctggttcgc | 300 |
| gaaggcctgc | gcaacgtcgc | agccggcgcc | aaccgcctcg | gcctcaagcg | tggcatcgag | 360 |
| aaggctgtcg | aggctgtcac | ccagtcgtcg | ctgaagtcgg | ccaaggagggt | cgagaccaag | 420 |
| gagcagattt | ctgccaccgc | ggcgatttcc | gccggcgaca | cccagatcgg | cgagctcatc | 480 |
| gccgaggcca | tggacaaggt | cggcaacgag | ggtgtcatca | ccgtcgagga | gtcgaacacc | 540 |
| ttcggcctgc | agctcgagct | caccgagggt | atgcgcttcg | acaagggcta | catctcgggt | 600 |
| tacttcgtga | ccgacgccga | gcgccaggaa | gccgtcctgg | aggatcc | | 647 |

<210> 116
 <211> 927
 <212> DNA
 <213> Mycobacterium vaccae

<400> 116

| | | | | | | |
|-------------|------------|------------|------------|------------|-------------|-----|
| gatccctaca | tctgtctggt | cagctccaag | gtgtcgaccg | tcaaggatct | gctcccgtcg | 60 |
| ctggagaagg | tcatccaggc | cggcaagccg | ctgctgatca | tcgccgagga | cgtcgagggc | 120 |
| gaggccctgt | ccacgctggt | ggtcaacaag | atccgcggca | ccttcaagtc | cgtcgccgtc | 180 |
| aaggctccgg | gcttcggtga | ccgccgcaag | gcgatgctgc | aggacatggc | catcctcacc | 240 |
| ggtggtcagg | tcgtcagcga | aagagtcggg | ctgtccctgg | agaccgccga | cgtctcgtcg | 300 |
| ctgggccagg | cccgaagggt | cgtcgtcacc | aaggacgaga | ccaccatcgt | cgagggctcg | 360 |
| ggcgattccg | atgccatcgc | cggccgggtg | gctcagatcc | gcgccgagat | cgagaacagc | 420 |
| gactccgact | acgaccgcga | gaagctgcag | gagcgcctgg | ccaagctggc | cggcgggtgt | 480 |
| gcggtgatca | aggccggagc | tgccaccgag | gtggagctca | aggagcgcaa | gcaccgcata | 540 |
| gaggacgccg | tccgcaacgc | gaaggctgcc | gtcgaagagg | gcatcgctcg | cgggtggcggc | 600 |
| gtggctctgc | tgcatgcggc | tcttgcgctg | gacgacctcg | gcctgacggg | cgacgaggcc | 660 |
| accggtgccca | acatcgtccg | cgtggcgctg | tcggctccgc | tcaagcagat | cgccttcaac | 720 |
| ggcggcctgg | agcccggcgt | cgttgccgag | aaggtgtcca | acctgcccgc | gggtcacggc | 780 |
| ctcaacgccg | cgaccggtga | gtacgaggac | ctgctcaagg | ccggcgctcg | cgaccgggtg | 840 |
| aaggtcaccc | gctcggcgct | gcagaacgcg | gcgtccatcg | cggtctctgt | cctcaccacc | 900 |
| gaggccgtcg | tcgccgacaa | gccggag | | | | 927 |

<210> 117
 <211> 215
 <212> PRT
 <213> Mycobacterium vaccae

<400> 117

```

Met Ala Lys Thr Ile Ala Tyr Asp Glu Glu Ala Arg Arg Gly Leu Glu
 1           5           10           15
Arg Gly Leu Asn Ala Leu Ala Asp Ala Val Lys Val Thr Leu Gly Pro
          20          25          30
Lys Gly Arg Asn Val Val Leu Glu Lys Lys Trp Gly Ala Pro Thr Ile
          35          40          45
Thr Asn Asp Gly Val Ser Ile Ala Lys Glu Ile Glu Leu Glu Asp Pro
          50          55          60
Tyr Glu Lys Ile Gly Ala Glu Leu Val Lys Glu Val Ala Lys Lys Thr
          65          70          75          80
Asp Asp Val Ala Gly Asp Gly Thr Thr Thr Ala Thr Val Leu Ala Gln
          85          90          95
Ala Leu Val Arg Glu Gly Leu Arg Asn Val Ala Ala Gly Ala Asn Pro
          100         105         110
Leu Gly Leu Lys Arg Gly Ile Glu Lys Ala Val Glu Ala Val Thr Gln
          115         120         125
Ser Leu Leu Lys Ser Ala Lys Glu Val Glu Thr Lys Glu Gln Ile Ser
          130         135         140
Ala Thr Ala Ala Ile Ser Ala Gly Asp Thr Gln Ile Gly Glu Leu Ile
          145         150         155         160
Ala Glu Ala Met Asp Lys Val Gly Asn Glu Gly Val Ile Thr Val Glu
          165         170         175
Glu Ser Asn Thr Phe Gly Leu Gln Leu Glu Leu Thr Glu Gly Met Arg
          180         185         190
Phe Asp Lys Gly Tyr Ile Ser Gly Tyr Phe Val Thr Asp Ala Glu Arg
          195         200         205
Gln Glu Ala Val Leu Glu Asp
          210         215

```

<210> 118
 <211> 309
 <212> PRT
 <213> Mycobacterium vaccae

<400> 118

```

Asp Pro Tyr Ile Leu Leu Val Ser Ser Lys Val Ser Thr Val Lys Asp
 1           5           10           15
Leu Leu Pro Leu Leu Glu Lys Val Ile Gln Ala Gly Lys Pro Leu Leu
          20          25          30
Ile Ile Ala Glu Asp Val Glu Gly Glu Ala Leu Ser Thr Leu Val Val
          35          40          45
Asn Lys Ile Arg Gly Thr Phe Lys Ser Val Ala Val Lys Ala Pro Gly
          50          55          60
Phe Gly Asp Arg Arg Lys Ala Met Leu Gln Asp Met Ala Ile Leu Thr
          65          70          75          80
Gly Gly Gln Val Val Ser Glu Arg Val Gly Leu Ser Leu Glu Thr Ala
          85          90          95
Asp Val Ser Leu Leu Gly Gln Ala Arg Lys Val Val Val Thr Lys Asp
          100         105         110
Glu Thr Thr Ile Val Glu Gly Ser Gly Asp Ser Asp Ala Ile Ala Gly
          115         120         125

```

```

Arg Val Ala Gln Ile Arg Ala Glu Ile Glu Asn Ser Asp Ser Asp Tyr
130          135          140
Asp Arg Glu Lys Leu Gln Glu Arg Leu Ala Lys Leu Ala Gly Gly Val
145          150          155          160
Ala Val Ile Lys Ala Gly Ala Ala Thr Glu Val Glu Leu Lys Glu Arg
165          170          175
Lys His Arg Ile Glu Asp Ala Val Arg Asn Ala Lys Ala Ala Val Glu
180          185          190
Glu Gly Ile Val Ala Gly Gly Gly Val Ala Leu Leu Gln Ser Ala Pro
195          200          205
Ala Leu Asp Asp Leu Gly Leu Thr Gly Asp Glu Ala Thr Gly Ala Asn
210          215          220
Ile Val Arg Val Ala Leu Ser Ala Pro Leu Lys Gln Ile Ala Phe Asn
225          230          235          240
Gly Gly Leu Glu Pro Gly Val Val Ala Glu Lys Val Ser Asn Leu Pro
245          250          255
Ala Gly His Gly Leu Asn Ala Ala Thr Gly Glu Tyr Glu Asp Leu Leu
260          265          270
Lys Ala Gly Val Ala Asp Pro Val Lys Val Thr Arg Ser Ala Leu Gln
275          280          285
Asn Ala Ala Ser Ile Ala Ala Leu Phe Leu Thr Thr Glu Ala Val Val
290          295          300
Ala Asp Lys Pro Glu
305

```

```

<210> 119
<211> 162
<212> DNA
<213> Mycobacterium vaccae

```

```

<400> 119
ctcgtacagg cgacggagat ctccgacgac gccacgtcgg tacggttggt cgccaccctg      60
ttcggcgctcg tgttggtgac gttggtgctg tccgggctca acgccaccct catccagggc    120
gcaccagaag acagctggcg caggcggatt ccgtcgatct tc                          162

```

```

<210> 120
<211> 1366
<212> DNA
<213> Mycobacterium vaccae

```

```

<220>
<221> unsure
<222> (955)...(955)

```

```

<221> unsure
<222> (973)...(973)

```

```

<400> 120
gatgagcagc gtgctgaact cgacctggtt ggccctgggccc gtcgcggtcg cggtcggggtt      60
cccggtgctg ctggtcgtgc tgaccgaggt gcacaacgcg ttgcgtcggc ggggcagcgc      120
gctggcccgc ccggtgcaac tcttgcttac ctacatcctg ccgctgggcg cgttgctgct      180
cctgctggta caggcgatgg agatctccga cgacgccacg tcggtacggt tggtcgccac      240
cctgttcggc gtcgtgttgt tgacgttggt gctgtccggg ctcaacgccca cctcatcca      300
gggcgcacca gaagacagct ggcgcaggcg gattccgtcg atcttctcgc acgtcgcgcg      360
cttcgcgctg atcgcggtcg gtatcacctg gatcatggcc tatgtctggg gcgcgaacgt      420
ggggggcctg ttcaccgcac tgggcgtcac ttccatcgtt cttggcctgg ctctgcagaa      480
ttcggtcggt cagatcatct cgggtctgct gctgctgttc gagcaaccgt tccggctcgg      540

```

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OF THE
ROYAL ANTHROPOLOGICAL INSTITUTE
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PART I.
1905.

<211> 455

<213> Mycobacterium vaccae

<221> UNSURE

<221> UNSURE

 $\langle 222 \rangle \quad (324) \dots (324)$

46

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 225 | | 230 | | 235 | | 240 | | | | | | | | | |
| Val | Val | Thr | Thr | Phe | Asn | Ala | Ala | Asp | Thr | Pro | Asp | Asp | Val | Cys | Glu |
| | | | | 245 | | | | | 250 | | | | | 255 | |
| Met | Leu | Ser | Ser | Val | Ala | Ala | Ser | Leu | Pro | Glu | Leu | Arg | Thr | Asp | Gly |
| | | | 260 | | | | | 265 | | | | | 270 | | |
| Gln | Ile | Ala | Thr | Leu | Tyr | Leu | Gly | Ala | Ala | Glu | Tyr | Glu | Lys | Ser | Ile |
| | | 275 | | | | | 280 | | | | | 285 | | | |
| Pro | Leu | His | Thr | Pro | Ala | Val | Asp | Asp | Ser | Val | Arg | Ser | Thr | Tyr | Leu |
| | 290 | | | | | 295 | | | | | 300 | | | | |
| Arg | Trp | Val | Trp | Tyr | Ala | Ala | Arg | Arg | Gln | Glu | Leu | Arg | Xaa | Asn | Gly |
| 305 | | | | | 310 | | | | | 315 | | | | | 320 |
| Val | Ala | Asp | Xaa | Phe | Asp | Thr | Pro | Glu | Arg | Ile | Ala | Ser | Ala | Met | Arg |
| | | | 325 | | | | | | 330 | | | | | 335 | |
| Ala | Val | Ala | Ser | Thr | Leu | Arg | Leu | Ala | Asp | Asp | Glu | Gln | Gln | Glu | Ile |
| | | 340 | | | | | | 345 | | | | | 350 | | |
| Ala | Asp | Val | Val | Arg | Leu | Val | Arg | Tyr | Gly | Asn | Gly | Glu | Arg | Leu | Gln |
| | 355 | | | | | 360 | | | | | 365 | | | | |
| Gln | Pro | Gly | Gln | Val | Pro | Thr | Gly | Met | Arg | Phe | Ile | Val | Asp | Gly | Arg |
| | 370 | | | | | 375 | | | | | 380 | | | | |
| Val | Ser | Leu | Ser | Val | Ile | Asp | Gln | Asp | Gly | Asp | Val | Ile | Pro | Ala | Arg |
| 385 | | | | | 390 | | | | | 395 | | | | | 400 |
| Val | Leu | Glu | Arg | Gly | Asp | Phe | Leu | Gly | Gln | Thr | Thr | Leu | Thr | Arg | Glu |
| | | | 405 | | | | | 410 | | | | | 415 | | |
| Pro | Val | Leu | Ala | Thr | Ala | His | Ala | Leu | Glu | Glu | Val | Thr | Val | Leu | Glu |
| | | 420 | | | | | 425 | | | | | 430 | | | |
| Met | Ala | Arg | Asp | Glu | Ile | Glu | Arg | Leu | Val | His | Arg | Lys | Pro | Ile | Leu |
| | 435 | | | | | 440 | | | | | 445 | | | | |
| Leu | His | Val | Ile | Gly | Ala | Val | | | | | | | | | |
| | 450 | | | | | 455 | | | | | | | | | |

<210> 122
 <211> 898
 <212> DNA
 <213> Mycobacterium vaccae

| | |
|------------|------------|
| <400> 122 | |
| atgacaattc | tgccctggaa |
| cgctaccacc | tctgtctgag |
| accagcattc | tctcggtgag |
| ctgcgcgcac | cggtgttcga |
| gagaatcagt | tcgcggacct |
| acggaggcga | tcggcgcggt |
| accgggcagg | cggcgtcatt |
| gacgacagcg | gaaaccgcgt |
| tatctgcagg | cgctctatac |
| gacgcgcgcg | acggcagcgc |
| gagatcgtgc | accgcttcaa |
| gtgtactccg | cctacaaggg |
| aaccgggaac | tgctcggaag |
| ggtgtcaccg | acttcgggtg |
| ccggtcgggt | tgaaggaccg |
| tctgaacacc | cgacgcgaaa |
| cagtccaagt | tgctgctgat |
| ttcatcggtc | atcagtcagg |
| gacatccgcg | agtcgcagtc |
| actcgcgcgg | cagcactgcc |
| tcggcgatgc | gacgatcaat |
| cgttcgccaa | caccaccctc |
| cgaaatccaa | ccccagcgc |
| agaaggcgat | cgcgttcgac |
| gattcaacga | gttcttccgc |
| tcgacctcga | gggcaacgtg |
| tcgtcaacgg | cccctatcgc |
| cgaactcgat | cgactatgtc |
| cgaccgcctg | gttctgttcc |
| tccagttccc | cggaattc |
| | 60 |
| | 120 |
| | 180 |
| | 240 |
| | 300 |
| | 360 |
| | 420 |
| | 480 |
| | 540 |
| | 600 |
| | 660 |
| | 720 |
| | 780 |
| | 840 |
| | 898 |

<210> 123
 <211> 1259
 <212> DNA
 <213> Mycobacterium vaccae

<400> 123

| | | | | | | |
|------------|------------|------------|-------------|-------------|-------------|------|
| cgcaattgat | gacggcgcg | ggacagtggc | gtgacaccgg | gatgggagac | accggtgaga | 60 |
| ccatcctggt | cggaccggac | aatctgatgc | gctcggactc | cgggctgttc | cgcgagaacc | 120 |
| gggagaagtt | cctggccgac | gtcgtcgagg | ggggaacccc | gccggagggtc | gccgacgaat | 180 |
| cggttgaccg | cgcggcgacc | acgctggtgc | agccggtgac | caccgcgtcc | gtcgaggagg | 240 |
| cccaacgcgg | caacaccggg | acgacgatcg | aggacgacta | tctcggccac | gaggcggttac | 300 |
| aggcgtactc | accggtggac | ctgccgggac | tgcactgggt | gatcgtggcc | aagatcgaca | 360 |
| cggacgaggc | gttcgccccg | gtggcgagc | tcaccaggac | cctggtgctg | tcgacggtga | 420 |
| tcacatcttt | cggcggtgtc | ctggcgccca | tgtctgtggc | gcggttggtc | gtccgtccga | 480 |
| tccggcggtt | gcaggccggc | gcccagcaga | tcagcgggcg | tgactaccgc | ctcgctctgc | 540 |
| cgggtgtgtc | tcgtgacgaa | ttcggcgatc | tgacaacagc | tttcaacgac | atgagtcgca | 600 |
| atctgtcgat | caaggacgag | ctgctcggcg | aggagcgcg | cgagaaccaa | cggctgatgc | 660 |
| gtccctgat | gcccgaaccg | gtgatgcagc | gctacctcga | cggggaggag | acgatcgccc | 720 |
| aggaccacaa | gaacgtcacg | gtgatcttcg | ccgacatgat | gggcctcgac | gagttgtcgc | 780 |
| gcattgtgac | ctccgaggaa | ctgatggtgg | tggtcaacga | cctgaccgcg | cagttcgacg | 840 |
| cgcggcgga | gagtcctcgg | gtcgaccacg | tgcgagcgct | gcacgacggg | tacctggcca | 900 |
| gctgcgggtt | aggcgtgccg | cggctggaca | acgtccggcg | cacggtcaat | ttcgcgatcg | 960 |
| aaatggaccg | catcatcgac | cggcacgccc | ccgagtcggc | gcacgacctg | cggctcccg | 1020 |
| cgggcatcga | caccgggtcg | gcggccagcg | ggctgggtggg | gcggtccacg | ttggcgtagc | 1080 |
| acatgtgggg | ttcggcggtc | gatgtcgctt | accaggtgca | gcgcggctcc | ccccagccc | 1140 |
| gcattctacg | cacctcgcg | gtgcacgagg | tcattcgagg | aactctcgac | ttcgtcgccg | 1200 |
| cgggggaggt | cgtcggcgag | cgcggcgctc | agacgggtctg | gcggttgacg | ggccacccg | 1259 |

<210> 124

<211> 299

<212> PRT

<213> Mycobacterium vaccae

<400> 124

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Thr | Ile | Leu | Pro | Trp | Asn | Ala | Arg | Thr | Ser | Glu | His | Pro | Thr | Arg |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Lys | Arg | Arg | Gly | Arg | Tyr | His | Leu | Leu | Ser | Arg | Met | Ser | Ile | Gln | Ser |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Lys | Leu | Leu | Leu | Met | Leu | Leu | Leu | Thr | Ser | Ile | Leu | Ser | Ala | Ala | Val |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Val | Gly | Phe | Ile | Gly | Tyr | Gln | Ser | Gly | Arg | Ser | Ser | Leu | Arg | Ala | Ser |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| Val | Phe | Asp | Arg | Leu | Thr | Asp | Ile | Arg | Glu | Ser | Gln | Ser | Arg | Gly | Leu |
| | 65 | | | | 70 | | | | | 75 | | | | | 80 |
| Glu | Asn | Gln | Phe | Ala | Asp | Leu | Lys | Asn | Ser | Met | Val | Ile | Tyr | Ser | Arg |
| | | | 85 | | | | | 90 | | | | | 95 | | |
| Gly | Ser | Thr | Ala | Thr | Glu | Ala | Ile | Gly | Ala | Phe | Ser | Asp | Gly | Phe | Arg |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Gln | Leu | Gly | Asp | Ala | Thr | Ile | Asn | Thr | Gly | Gln | Ala | Ala | Ser | Leu | Arg |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Arg | Tyr | Tyr | Asp | Arg | Thr | Phe | Ala | Asn | Thr | Thr | Leu | Asp | Asp | Ser | Gly |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Asn | Arg | Val | Asp | Val | Arg | Ala | Leu | Ile | Pro | Lys | Ser | Asn | Pro | Gln | Arg |
| | 145 | | | | 150 | | | | | 155 | | | | 160 | |
| Tyr | Leu | Gln | Ala | Leu | Tyr | Thr | Pro | Pro | Phe | Gln | Asn | Trp | Glu | Lys | Ala |
| | | | 165 | | | | | 170 | | | | | | 175 | |
| Ile | Ala | Phe | Asp | Asp | Ala | Arg | Asp | Gly | Ser | Ala | Trp | Ser | Ala | Ala | Asn |
| | | | 180 | | | | | 185 | | | | | 190 | | |
| Ala | Arg | Phe | Asn | Glu | Phe | Phe | Arg | Glu | Ile | Val | His | Arg | Phe | Asn | Phe |
| | 195 | | | | | | 200 | | | | | 205 | | | |
| Glu | Asp | Leu | Met | Leu | Leu | Asp | Leu | Glu | Gly | Asn | Val | Val | Tyr | Ser | Ala |
| | 210 | | | | | 215 | | | | | 220 | | | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Tyr | Lys | Gly | Pro | Asp | Leu | Gly | Thr | Asn | Ile | Val | Asn | Gly | Pro | Tyr | Arg |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 |
| Asn | Arg | Glu | Leu | Ser | Glu | Ala | Tyr | Glu | Lys | Ala | Val | Ala | Ser | Asn | Ser |
| | | | | 245 | | | | | 250 | | | | | 255 | |
| Ile | Asp | Tyr | Val | Gly | Val | Thr | Asp | Phe | Gly | Trp | Tyr | Leu | Pro | Ala | Glu |
| | | | 260 | | | | | 265 | | | | | 270 | | |
| Glu | Pro | Thr | Ala | Trp | Phe | Leu | Ser | Pro | Val | Gly | Leu | Lys | Asp | Arg | Val |
| | | 275 | | | | | 280 | | | | | 285 | | | |
| Asp | Gly | Val | Met | Ala | Val | Gln | Phe | Pro | Gly | Ile | | | | | |
| 290 | | | | | | 295 | | | | | | | | | |

<210> 125

<211> 419

<212> PRT

<213> Mycobacterium vaccae

<400> 125

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gln | Leu | Met | Thr | Ala | Arg | Gly | Gln | Trp | Arg | Asp | Thr | Gly | Met | Gly | Asp |
| 1 | | | | 5 | | | | | 10 | | | | 15 | | |
| Thr | Gly | Glu | Thr | Ile | Leu | Val | Gly | Pro | Asp | Asn | Leu | Met | Arg | Ser | Asp |
| | | | 20 | | | | | 25 | | | | 30 | | | |
| Ser | Arg | Leu | Phe | Arg | Glu | Asn | Arg | Glu | Lys | Phe | Leu | Ala | Asp | Val | Val |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Glu | Gly | Gly | Thr | Pro | Pro | Glu | Val | Ala | Asp | Glu | Ser | Val | Asp | Arg | Arg |
| | | 50 | | | | 55 | | | | | 60 | | | | |
| Gly | Thr | Thr | Leu | Val | Gln | Pro | Val | Thr | Thr | Arg | Ser | Val | Glu | Glu | Ala |
| 65 | | | | | 70 | | | | 75 | | | | | | 80 |
| Gln | Arg | Gly | Asn | Thr | Gly | Thr | Thr | Ile | Glu | Asp | Asp | Tyr | Leu | Gly | His |
| | | | 85 | | | | | 90 | | | | | 95 | | |
| Glu | Ala | Leu | Gln | Ala | Tyr | Ser | Pro | Val | Asp | Leu | Pro | Gly | Leu | His | Trp |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Val | Ile | Val | Ala | Lys | Ile | Asp | Thr | Asp | Glu | Ala | Phe | Ala | Pro | Val | Ala |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Gln | Phe | Thr | Arg | Thr | Leu | Val | Leu | Ser | Thr | Val | Ile | Ile | Ile | Phe | Gly |
| | | 130 | | | | 135 | | | | | 140 | | | | |
| Val | Ser | Leu | Ala | Ala | Met | Leu | Leu | Ala | Arg | Leu | Phe | Val | Arg | Pro | Ile |
| 145 | | | | | 150 | | | | 155 | | | | | | 160 |
| Arg | Arg | Leu | Gln | Ala | Gly | Ala | Gln | Gln | Ile | Ser | Gly | Gly | Asp | Tyr | Arg |
| | | | 165 | | | | | | 170 | | | | | 175 | |
| Leu | Ala | Leu | Pro | Val | Leu | Ser | Arg | Asp | Glu | Phe | Gly | Asp | Leu | Thr | Thr |
| | | | 180 | | | | | 185 | | | | | 190 | | |
| Ala | Phe | Asn | Asp | Met | Ser | Arg | Asn | Leu | Ser | Ile | Lys | Asp | Glu | Leu | Leu |
| | | 195 | | | | | 200 | | | | | 205 | | | |
| Gly | Glu | Glu | Arg | Ala | Glu | Asn | Gln | Arg | Leu | Met | Leu | Ser | Leu | Met | Pro |
| | | 210 | | | | 215 | | | | | 220 | | | | |
| Glu | Pro | Val | Met | Gln | Arg | Tyr | Leu | Asp | Gly | Glu | Glu | Thr | Ile | Ala | Gln |
| 225 | | | | | 230 | | | | 235 | | | | | | 240 |
| Asp | His | Lys | Asn | Val | Thr | Val | Ile | Phe | Ala | Asp | Met | Met | Gly | Leu | Asp |
| | | | 245 | | | | | 250 | | | | | 255 | | |
| Glu | Leu | Ser | Arg | Met | Leu | Thr | Ser | Glu | Glu | Leu | Met | Val | Val | Val | Asn |
| | | | 260 | | | | | 265 | | | | | 270 | | |
| Asp | Leu | Thr | Arg | Gln | Phe | Asp | Ala | Ala | Ala | Glu | Ser | Leu | Gly | Val | Asp |
| | | 275 | | | | | 280 | | | | | 285 | | | |
| His | Val | Arg | Thr | Leu | His | Asp | Gly | Tyr | Leu | Ala | Ser | Cys | Gly | Leu | Gly |
| | | 290 | | | | 295 | | | | | 300 | | | | |
| Val | Pro | Arg | Leu | Asp | Asn | Val | Arg | Arg | Thr | Val | Asn | Phe | Ala | Ile | Glu |
| 305 | | | | | 310 | | | | | 315 | | | | | 320 |

Met Asp Arg Ile Ile Asp Arg His Ala Ala Glu Ser Gly His Asp Leu
325 330 335
Arg Leu Arg Ala Gly Ile Asp Thr Gly Ser Ala Ala Ser Gly Leu Val
340 345 350
Gly Arg Ser Thr Leu Ala Tyr Asp Met Trp Gly Ser Ala Val Asp Val
355 360 365
Ala Tyr Gln Val Gln Arg Gly Ser Pro Gln Pro Gly Ile Tyr Val Thr
370 375 380
Ser Arg Val His Glu Val Met Gln Glu Thr Leu Asp Phe Val Ala Ala
385 390 395 400
Gly Glu Val Val Gly Glu Arg Gly Val Glu Thr Val Trp Arg Leu Gln
405 410 415
Gly His Pro

<210> 126
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> Made in a lab

<400> 126
ccggatccga tgagcagcgt gctgaac

27

<210> 127
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> Made in a lab

<400> 127
gcggatccca cggccccgat cacgtg

26

<210> 128
<211> 33
<212> DNA
<213> Artificial Sequence

<220>
<223> Made in a lab

<400> 128
ccggatccaa tgacatttct gccctggaat gcg

33

<210> 129
<211> 32
<212> DNA
<213> Artificial Sequence

<220>
<223> Made in a lab

<400> 129

ccggatccat tcggtggccc tgcaaccgcc ag

32

<210> 130
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> Made in a lab

<400> 130
ccggatccgg agcaaccggt ccggctc

27

<210> 131
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> Made in a lab

<400> 131
ccggatcccg gctatcagtc cggacgg

27

<210> 132
<211> 844
<212> DNA
<213> Mycobacterium vaccae

<400> 132

| | | | | | | |
|------------|-------------|------------|-------------|-------------|------------|-----|
| gagcaaccgt | tccgggtcgg | cgactggatc | accgtcccca | ccgcggcggg | ccggccgtcc | 60 |
| gcccacggcc | gcgtgggtgga | agtcaactgg | cgtgcaacac | atatcgacac | ccggcggaac | 120 |
| ctgctggtaa | tgcccaacgc | cgaactcgcc | ggcgcgctcgt | tcaccaatta | cagccggccc | 180 |
| gtgggagagc | accgggtgac | cgtcgtcacc | accttcaacg | ccgcggaacac | ccccgatgat | 240 |
| gtctgcgaga | tgctgtcgtc | ggcgcggcg | tcgctgcccg | aactgcgcac | cgacggacag | 300 |
| atcgccacgc | tctatctcgg | tgcgcccgaa | tacgagaagt | cgatcccgtt | gcacacaccc | 360 |
| gcggtggacg | actcggtcag | gagcacgtac | ctgcgatggg | tctggtacgc | cgcgcgccgg | 420 |
| caggaacttc | gcctaaccgg | gtcgccgacg | attcgacacg | ccggaacgga | tcgcctcggc | 480 |
| catgcgggct | gtggcgctcca | cactgcgctt | ggcagacgac | gaacagcagg | agatcgccga | 540 |
| cgtggtgcgt | ctggtccgtt | acggcaacgg | ggaacgcctc | cagcagccgg | gtcaggtacc | 600 |
| gaccgggatg | aggttcacgc | tagacggcag | ggtgagctctg | tccgtgatcg | atcaggacgg | 660 |
| cgacgtgatc | ccggcgcggg | tgctcgagcg | tggcgacttc | ctggggcaga | ccacgctgac | 720 |
| gcgggaaccg | gtactggcga | ccgcgcacgc | gctggaggaa | gtcaccgtgc | tggagatggc | 780 |
| ccgtgacgag | atcgagcgcc | tggtgcaccg | aaagccgatc | ctgctgcacg | tgatcggggc | 840 |
| cgtg | | | | | | 844 |

<210> 133
<211> 742
<212> DNA
<213> Mycobacterium vaccae

<400> 133

| | | | | | | |
|------------|------------|-------------|------------|------------|------------|-----|
| ggctatcagt | ccggacggtc | ctcgctgcgc | gcatcggtgt | tcgaccgcct | caccgacatc | 60 |
| cgcgagtcgc | agtcgcgcgg | ggtggagaat | cagttcgcgg | acctgaagaa | ctcgatggtg | 120 |
| atttactcgc | gcggcagcac | tgccacggag | gcgatcggcg | cgttcagcga | cggtttccgt | 180 |
| cagctcggcg | atgcgacgat | caataaccggg | caggcgccgt | cattgcgcgc | ttactacgac | 240 |
| cggacgttcg | ccaacaccac | cctcgacgac | agcggaacc | gcgtcgacgt | ccgcgcgctc | 300 |

atccccgaaat ccaacccccca ggcgtatctg caggcgctct atacccccgcc gtttcagaac 360
 tgggagaagg cgatcgcggt cgacgacgcg cgcgacggca ggcgctggtc ggccgccaat 420
 gccagattca acgagttctt ccgcgagatc gtgcaccgct tcaacttcga ggatctgatg 480
 ctgctcgacc tcgagggcaa cgtgggtgtac tccgcctaca agggggccgga tctcgggaca 540
 aacatcgta acggccccta tcgcaaccgg gaactgtcgg aagcctacga gaaggcggtc 600
 gcgtcgaaat cgatcgacta tgtcgggtgtc accgacttcg ggtggtacct gcctgccgag 660
 gaaccgaccg cctgggttct gtccccggtc gggttgaagg accgagtcga cgggtgtgatg 720
 gcggtccagt tccccggaat tc 742

<210> 134
 <211> 282
 <212> PRT
 <213> Mycobacterium vaccae

<220>
 <221> UNSURE
 <222> (145)...(145)

<221> UNSURE
 <222> (151)...(151)

<400> 134

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Glu | Gln | Pro | Phe | Arg | Leu | Gly | Asp | Trp | Ile | Thr | Val | Pro | Thr | Ala | Ala |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Gly | Arg | Pro | Ser | Ala | His | Gly | Arg | Val | Val | Glu | Val | Asn | Trp | Arg | Ala |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Thr | His | Ile | Asp | Thr | Gly | Gly | Asn | Leu | Leu | Val | Met | Pro | Asn | Ala | Glu |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Leu | Ala | Gly | Ala | Ser | Phe | Thr | Asn | Tyr | Ser | Arg | Pro | Val | Gly | Glu | His |
| | 50 | | | | | | 55 | | | | 60 | | | | |
| Arg | Leu | Thr | Val | Val | Thr | Thr | Phe | Asn | Ala | Ala | Asp | Thr | Pro | Asp | Asp |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Val | Cys | Glu | Met | Leu | Ser | Ser | Val | Ala | Ala | Ser | Leu | Pro | Glu | Leu | Arg |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Thr | Asp | Gly | Gln | Ile | Ala | Thr | Leu | Tyr | Leu | Gly | Ala | Ala | Glu | Tyr | Glu |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Lys | Ser | Ile | Pro | Leu | His | Thr | Pro | Ala | Val | Asp | Asp | Ser | Val | Arg | Ser |
| | | 115 | | | | | | 120 | | | | 125 | | | |
| Thr | Tyr | Leu | Arg | Trp | Val | Trp | Tyr | Ala | Ala | Arg | Arg | Gln | Glu | Leu | Arg |
| | | 130 | | | | 135 | | | | 140 | | | | | |
| Xaa | Asn | Gly | Val | Ala | Asp | Xaa | Phe | Asp | Thr | Pro | Glu | Arg | Ile | Ala | Ser |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Ala | Met | Arg | Ala | Val | Ala | Ser | Thr | Leu | Arg | Leu | Ala | Asp | Asp | Glu | Gln |
| | | | | 165 | | | | | 170 | | | | | 175 | |
| Gln | Glu | Ile | Ala | Asp | Val | Val | Arg | Leu | Val | Arg | Tyr | Gly | Asn | Gly | Glu |
| | | | 180 | | | | | 185 | | | | | 190 | | |
| Arg | Leu | Gln | Gln | Pro | Gly | Gln | Val | Pro | Thr | Gly | Met | Arg | Phe | Ile | Val |
| | | 195 | | | | | 200 | | | | | 205 | | | |
| Asp | Gly | Arg | Val | Ser | Leu | Ser | Val | Ile | Asp | Gln | Asp | Gly | Asp | Val | Ile |
| | 210 | | | | | 215 | | | | | 220 | | | | |
| Pro | Ala | Arg | Val | Leu | Glu | Arg | Gly | Asp | Phe | Leu | Gly | Gln | Thr | Thr | Leu |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 |
| Thr | Arg | Glu | Pro | Val | Leu | Ala | Thr | Ala | His | Ala | Leu | Glu | Glu | Val | Thr |
| | | | | 245 | | | | | 250 | | | | | 255 | |
| Val | Leu | Glu | Met | Ala | Arg | Asp | Glu | Ile | Glu | Arg | Leu | Val | His | Arg | Lys |
| | | | 260 | | | | | 265 | | | | | 270 | | |
| Pro | Ile | Leu | Leu | His | Val | Ile | Gly | Ala | Val | | | | | | |

275

280

<210> 135

<211> 247

<212> PRT

<213> Mycobacterium vaccae

<400> 135

Gly Tyr Gln Ser Gly Arg Ser Ser Leu Arg Ala Ser Val Phe Asp Arg
1 5 10 15
Leu Thr Asp Ile Arg Glu Ser Gln Ser Arg Gly Leu Glu Asn Gln Phe
20 25 30
Ala Asp Leu Lys Asn Ser Met Val Ile Tyr Ser Arg Gly Ser Thr Ala
35 40 45
Thr Glu Ala Ile Gly Ala Phe Ser Asp Gly Phe Arg Gln Leu Gly Asp
50 55 60
Ala Thr Ile Asn Thr Gly Gln Ala Ala Ser Leu Arg Arg Tyr Tyr Asp
65 70 75 80
Arg Thr Phe Ala Asn Thr Thr Leu Asp Asp Ser Gly Asn Arg Val Asp
85 90 95
Val Arg Ala Leu Ile Pro Lys Ser Asn Pro Gln Arg Tyr Leu Gln Ala
100 105 110
Leu Tyr Thr Pro Pro Phe Gln Asn Trp Glu Lys Ala Ile Ala Phe Asp
115 120 125
Asp Ala Arg Asp Gly Ser Ala Trp Ser Ala Ala Asn Ala Arg Phe Asn
130 135 140
Glu Phe Phe Arg Glu Ile Val His Arg Phe Asn Phe Glu Asp Leu Met
145 150 155 160
Leu Leu Asp Leu Glu Gly Asn Val Val Tyr Ser Ala Tyr Lys Gly Pro
165 170 175
Asp Leu Gly Thr Asn Ile Val Asn Gly Pro Tyr Arg Asn Arg Glu Leu
180 185 190
Ser Glu Ala Tyr Glu Lys Ala Val Ala Ser Asn Ser Ile Asp Tyr Val
195 200 205
Gly Val Thr Asp Phe Gly Trp Tyr Leu Pro Ala Glu Glu Pro Thr Ala
210 215 220
Trp Phe Leu Ser Pro Val Gly Leu Lys Asp Arg Val Asp Gly Val Met
225 230 235 240
Ala Val Gln Phe Pro Gly Ile
245

<210> 136

<211> 45

<212> DNA

<213> Mycobacterium vaccae

<220>

<221> unsure

<222> (18)...(18)

<400> 136

atgagcgaaa tcgcccgncc ctggcgggtt ctggcatgtg gcatc

45

<210> 137

<211> 340

<212> DNA

<213> Mycobacterium vaccae

<220>
 <221> unsure
 <222> (273)...(273)

<221> unsure
 <222> (286)...(286)

<400> 137

| | | | | | | |
|------------|------------|-------------|------------|------------|------------|-----|
| gccaccggcg | gcgcgcgcgc | gggtgcccgc | ggggtgagcg | ccccggcggt | cgcgccggcc | 60 |
| ccgcgatgc | ccgcccgcgc | gggtgtccacg | atcgcgccgg | cgacctcggg | cacgttcagc | 120 |
| gagtttttcg | ccgccaaggg | cgtcacgatg | gagccgcagt | ccagccgcga | cttcgcgcgc | 180 |
| ctcaacatcg | tgctgcccga | gccgcggggc | tgggagcaca | tcccggaccc | gaacgtgccg | 240 |
| gacgcgttcg | cggtgctggc | cgaccgggtc | agnggtaaag | gtcagnagtc | gacaaacgcc | 300 |
| cacgtggtgg | tcgacaaaca | cgtaggcgag | ttcgacggca | | | 340 |

<210> 138
 <211> 235
 <212> DNA
 <213> Mycobacterium vaccae

<220>
 <221> unsure
 <222> (16)...(16)

<400> 138

| | | | | | | |
|------------|------------|------------|------------|-------------|------------|-----|
| ggtgaccacc | agcgtngaac | aggtcgttgc | cgaagccgcg | gaggccaccg | acgcgattgt | 60 |
| caacgggttc | aaggtcagcg | ttccgggtcc | gggtccggcc | gcaccgccac | ctgcaccggg | 120 |
| tgcccccggt | gtcccgcgcg | ccccggcgcg | cccggcgctg | ccgctggccg | tcgcaccacc | 180 |
| cccggctccc | gctgttcccg | ccgtggcgcc | cgcgccacag | ctgctggggac | tgag | 235 |

<210> 139
 <211> 15
 <212> PRT
 <213> Mycobacterium vaccae

<400> 139

| | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Ser | Glu | Ile | Ala | Arg | Pro | Trp | Arg | Val | Leu | Ala | Cys | Gly | Ile |
| 1 | | | | 5 | | | | | 10 | | | | | 15 |

<210> 140
 <211> 113
 <212> PRT
 <213> Mycobacterium vaccae

<220>
 <221> UNSURE
 <222> (96)...(96)

<400> 140

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ala | Thr | Gly | Gly | Ala | Ala | Ala | Val | Pro | Ala | Gly | Val | Ser | Ala | Pro | Ala |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Val | Ala | Pro | Ala | Pro | Ala | Met | Pro | Ala | Arg | Pro | Val | Ser | Thr | Ile | Ala |
| | | | | 20 | | | | | 25 | | | | 30 | | |
| Pro | Ala | Thr | Ser | Gly | Thr | Leu | Ser | Glu | Phe | Phe | Ala | Ala | Lys | Gly | Val |
| | | | | 35 | | | | 40 | | | | 45 | | | |
| Thr | Met | Glu | Pro | Gln | Ser | Ser | Arg | Asp | Phe | Arg | Ala | Leu | Asn | Ile | Val |

50 55 60
 Leu Pro Lys Pro Arg Gly Trp Glu His Ile Pro Asp Pro Asn Val Pro
 65 70 75 80
 Asp Ala Phe Ala Val Leu Ala Asp Arg Val Gly Gly Lys Gly Gln Xaa
 85 90 95
 Ser Thr Asn Ala His Val Val Val Asp Lys His Val Gly Glu Phe Asp
 100 105 110
 Gly

<210> 141
 <211> 73
 <212> PRT
 <213> Mycobacterium vaccae

<400> 141
 Val Thr Thr Ser Val Glu Gln Val Val Ala Ala Ala Asp Ala Thr Glu
 1 5 10 15
 Ala Ile Val Asn Gly Phe Lys Val Ser Val Pro Gly Pro Gly Pro Ala
 20 25 30
 Ala Pro Pro Pro Ala Pro Gly Ala Pro Gly Val Pro Pro Ala Pro Gly
 35 40 45
 Ala Pro Ala Leu Pro Leu Ala Val Ala Pro Pro Pro Ala Pro Ala Val
 50 55 60
 Pro Ala Val Ala Pro Ala Pro Gln Leu
 65 70

<210> 142
 <211> 273
 <212> DNA
 <213> Mycobacterium vaccae

<400> 142
 gcgacctacg tgcagggggg tctcggccgc atcgaggccc ggggtggccga cagcggatac 60
 agcaacgcgc cggccaaggg ctacttcccg ctgagcttca ccgtcgccgg catcgaccag 120
 aacggtccga tcgtgaccgc caacgtcacc gggcgggccc cgacgggcgc cgtggccacc 180
 cagcgcgtga cgttcategc cgggccgagc ccgaccggat ggcagctgtc caagcagtc 240
 gcaactggccc tgatgtccgc ggtcatcgcc gca 273

<210> 143
 <211> 91
 <212> PRT
 <213> Mycobacterium vaccae

<400> 143
 Ala Thr Tyr Val Gln Gly Gly Leu Gly Arg Ile Glu Ala Arg Val Ala
 1 5 10 15
 Asp Ser Gly Tyr Ser Asn Ala Ala Lys Gly Tyr Phe Pro Leu Ser
 20 25 30
 Phe Thr Val Ala Gly Ile Asp Gln Asn Gly Pro Ile Val Thr Ala Asn
 35 40 45
 Val Thr Ala Ala Ala Pro Thr Gly Ala Val Ala Thr Gln Pro Leu Thr
 50 55 60
 Phe Ile Ala Gly Pro Ser Pro Thr Gly Trp Gln Leu Ser Lys Gln Ser
 65 70 75 80
 Ala Leu Ala Leu Met Ser Ala Val Ile Ala Ala
 85 90

<210> 144
 <211> 554
 <212> DNA
 <213> Mycobacterium vaccae

<400> 144

| | | | | | | |
|------------|-------------|------------|-------------|------------|------------|-----|
| gatgtcacgc | cgggagaatg | taacgttcga | cgggagaacg | ccgtcggcac | aacgagttac | 60 |
| gtttgagcac | ttcagatctc | ggttaccttg | gatttcaggc | gggggaagca | gtaaccgatc | 120 |
| caagattcga | aggacccaaa | caacatgaaa | ttcactggaa | tgaccgtgcg | cgcaagccgc | 180 |
| gcgccctggc | cggcgctcggg | gcggcatgtc | tgttcggcgg | cgtggccgcg | gcaaccgtgg | 240 |
| cggcacagat | ggcggggcgc | cagccggccg | agtgcacgc | cagctcactc | accggcaccg | 300 |
| tcagctcggt | gaccggtcag | gcgcgtcagt | acctagacac | ccaccggggc | gccaaccagg | 360 |
| ccgtcaccgc | ggcgatgaac | cagccgcggc | ccgaggccga | ggcgaacctg | cggggctact | 420 |
| tcaccgcca | cccgccggag | tactacgacc | tgccggggcat | cctcgccccg | atcggtgacg | 480 |
| cgcagcgcaa | ctgcaacatc | accgtgctgc | cggtagagct | gcagacggcc | tacgacacgt | 540 |
| tcatggccgg | ctga | | | | | 554 |

<210> 145
 <211> 136
 <212> PRT
 <213> Mycobacterium vaccae

<400> 145

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Lys | Phe | Thr | Gly | Met | Thr | Val | Arg | Ala | Ser | Arg | Arg | Ala | Leu | Ala |
| 1 | | | | 5 | | | | 10 | | | | | | 15 | |
| Gly | Val | Gly | Ala | Ala | Cys | Leu | Phe | Gly | Gly | Val | Ala | Ala | Ala | Thr | Val |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Ala | Ala | Gln | Met | Ala | Gly | Ala | Gln | Pro | Ala | Glu | Cys | Asn | Ala | Ser | Ser |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Leu | Thr | Gly | Thr | Val | Ser | Ser | Val | Thr | Gly | Gln | Ala | Arg | Gln | Tyr | Leu |
| | 50 | | | | | 55 | | | | 60 | | | | | |
| Asp | Thr | His | Pro | Gly | Ala | Asn | Gln | Ala | Val | Thr | Ala | Ala | Met | Asn | Gln |
| 65 | | | | | 70 | | | | 75 | | | | | 80 | |
| Pro | Arg | Pro | Glu | Ala | Glu | Ala | Asn | Leu | Arg | Gly | Tyr | Phe | Thr | Ala | Asn |
| | | | 85 | | | | | 90 | | | | | | 95 | |
| Pro | Ala | Glu | Tyr | Tyr | Asp | Leu | Arg | Gly | Ile | Leu | Ala | Pro | Ile | Gly | Asp |
| | | | 100 | | | | 105 | | | | | | 110 | | |
| Ala | Gln | Arg | Asn | Cys | Asn | Ile | Thr | Val | Leu | Pro | Val | Glu | Leu | Gln | Thr |
| | | 115 | | | | | 120 | | | | | | 125 | | |
| Ala | Tyr | Asp | Thr | Phe | Met | Ala | Gly | | | | | | | | |
| | 130 | | | | | 135 | | | | | | | | | |

<210> 146
 <211> 808
 <212> DNA
 <213> Mycobacterium vaccae

<220>
 <221> unsure
 <222> (15)...(15)

<400> 146

| | | | | | | |
|-------------|-------------|------------|------------|------------|------------|-----|
| ccaagtgtga | cgcngtgtg | acggtagacg | ttccgaccaa | tccaacgacg | ccgcagctgg | 60 |
| gaatcaccgc | tgtgccaaatt | cagtgcgggc | aacgggtgcc | gtccacgaag | ggattcagga | 120 |
| aatgatgaca | actcgccgga | agtcagccgc | agtggcggga | atcgctgcgg | tggccatcct | 180 |
| cgggtgcggcc | gcattgttga | gtgaggacgg | tgggagcacg | gcctcgtcgg | ccagcagcac | 240 |


```

ggcctcctcc gcgatggagt ccgcgaccga cgagatgacc acgtcgtcgg cggcccccttc 300
ggccgaccct gcggccaacc tgatcggctc cggtcgcgcg gcctacgccg agcaggtccc 360
cgaaggtccc gggtcggtgg ccgggatggc agccgatccg gtgacggtgg cggcgtcgaa 420
caaccgatg ctgcagacgc tgtcccaggc gctgtccggc cagctcaatc cgcaggtcaa 480
tctcgtcgac accctcgacg gcggtgagtt caccgtgttc gcgccgaccg acgacgcgtt 540
cgccaagatc gatccggcca cgctggagac cctcaagacg gactccgaca tgctgaccaa 600
catcctgacc taccacgtcg tgcccggcca ggccgcgccc gatcaggtgg tcggcgagca 660
tgtgacggtg gagggggcgc cggtcacggt gtccgggatg gccgaccagc tcaaggtcaa 720
cgacgcgtcg gtggtgtgcg gtggggtgca gaccgccaac gcgacggtgt atctgatcga 780
cacctgctg atgccgcgcg cagcgtag 808

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<210> 147

<211> 228

<212> PRT

<213> Mycobacterium vaccae

<400> 147

```

Met Met Thr Thr Arg Arg Lys Ser Ala Ala Val Ala Gly Ile Ala Ala
 1          5          10          15
Val Ala Ile Leu Gly Ala Ala Ala Cys Ser Ser Glu Asp Gly Gly Ser
 20          25          30
Thr Ala Ser Ser Ala Ser Ser Thr Ala Ser Ser Ala Met Glu Ser Ala
 35          40          45
Thr Asp Glu Met Thr Thr Ser Ser Ala Ala Pro Ser Ala Asp Pro Ala
 50          55          60
Ala Asn Leu Ile Gly Ser Gly Cys Ala Ala Tyr Ala Glu Gln Val Pro
 65          70          75          80
Glu Gly Pro Gly Ser Val Ala Gly Met Ala Ala Asp Pro Val Thr Val
 85          90          95
Ala Ala Ser Asn Asn Pro Met Leu Gln Thr Leu Ser Gln Ala Leu Ser
 100         105         110
Gly Gln Leu Asn Pro Gln Val Asn Leu Val Asp Thr Leu Asp Gly Gly
 115         120         125
Glu Phe Thr Val Phe Ala Pro Thr Asp Asp Ala Phe Ala Lys Ile Asp
 130         135         140
Pro Ala Thr Leu Glu Thr Leu Lys Thr Asp Ser Asp Met Leu Thr Asn
 145         150         155         160
Ile Leu Thr Tyr His Val Val Pro Gly Gln Ala Ala Pro Asp Gln Val
 165         170         175
Val Gly Glu His Val Thr Val Glu Gly Ala Pro Val Thr Val Ser Gly
 180         185         190
Met Ala Asp Gln Leu Lys Val Asn Asp Ala Ser Val Val Cys Gly Gly
 195         200         205
Val Gln Thr Ala Asn Ala Thr Val Tyr Leu Ile Asp Thr Val Leu Met
 210         215         220
Pro Pro Ala Ala
225

```

<210> 148

<211> 22

<212> DNA

<213> Artificial Sequence

<220>

<223> Made in a lab

<221> unsure

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<222> (12)...(12)

<221> unsure
<222> (17)...(17)

<400> 148
gcscscsgtsg gnccggnntgy gc 22

<210> 149
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Made in a lab

<221> unsure
<222> (10)...(10)

<221> unsure
<222> (13)...(13)

<221> unsure
<222> (16)...(16)

<221> unsure
<222> (20)...(20)

<400> 149
rtasgcsn gtnngnacng g 21

<210> 150
<211> 102
<212> DNA
<213> Artificial Sequence

<220>
<223> Made in a lab

<400> 150
gccccgctcg gccccggctg tgcggcctac gtgcaacagg tgccggacgg gccgggatcg 60
gtgcagggca tggcgagctc gcccgtagcg accgccgcgt at 102

<210> 151
<211> 683
<212> DNA
<213> Mycobacterium vaccae

<400> 151
gcccgcacaa taaaaccgcc gatcatccac tgcaggaagg aatctcacga tcatgaacat 60
cagcatgaaa actcttgccg gacggggttt cgcgatgacc gccgccgtcg gtctgtcgct 120
gggtaccgca ggcagcgccg cagccgcgcc ggtcggaccg ggggtgtgagg cctacgtgca 180
acaggtgccc gacggggccg gatcgggtga gggcatggcg agctcgccgg tggccaccgc 240
ggcgccgcac aaccgcgtgc tcaccacgct ctgcgaggcg atctcgggtc agctcaaccc 300
gaacgtcaat ctgctcgaca cgttcaacgg cggccagttc accgtgttcg cgccgaccaa 360
tgacgccttc gccaaagatc atccggccac gctggagacc ctcaagaccg attccgacct 420
gctgaccaag atctcacct accacgtcgt gcccggccag gccgcgcccg atcaggtggt 480

```

cggcgagcat gtgacggtgg agggggcgcc ggtcacggtg tccgggatgg ccgaccagct 540
 caaggtcaac gacgcgtcgg tgggtgtcgg tggggtgcag accgccaacg cgacggtgta 600
 tctgatcgac accgtgctga tgccgccggc agcgtagccg ggccggcacca cagaagaggg 660
 tccccgcac cggcctccc ccg 683

<210> 152
 <211> 231
 <212> PRT
 <213> Mycobacterium vaccae

<400> 152
 Asp Thr Val Leu Met Pro Pro Ala Asn Asn Arg Arg Ser Ser Thr Ala
 1 5 10 15
 Gly Arg Asn Leu Thr Ile Met Asn Ile Ser Met Lys Thr Leu Ala Gly
 20 25 30
 Ala Gly Phe Ala Met Thr Ala Ala Val Gly Leu Ser Leu Gly Thr Ala
 35 40 45
 Gly Ser Ala Ala Ala Ala Pro Val Gly Pro Gly Cys Ala Ala Tyr Val
 50 55 60
 Gln Gln Val Pro Asp Gly Pro Gly Ser Val Gln Gly Met Ala Ser Ser
 65 70 75 80
 Pro Val Ala Thr Ala Ala Ala Asp Asn Pro Leu Leu Thr Thr Leu Ser
 85 90 95
 Gln Ala Ile Ser Gly Gln Leu Asn Pro Asn Val Asn Leu Val Asp Thr
 100 105 110
 Phe Asn Gly Gly Gln Phe Thr Val Phe Ala Pro Thr Asn Asp Ala Phe
 115 120 125
 Ala Lys Ile Asp Pro Ala Thr Leu Glu Thr Leu Lys Thr Asp Ser Asp
 130 135 140
 Leu Leu Thr Lys Ile Leu Thr Tyr His Val Val Pro Gly Gln Ala Ala
 145 150 155 160
 Pro Asp Gln Val Val Gly Glu His Val Thr Val Glu Gly Ala Pro Val
 165 170 175
 Thr Val Ser Gly Met Ala Asp Gln Leu Lys Val Asn Asp Ala Ser Val
 180 185 190
 Val Cys Gly Gly Val Gln Thr Ala Asn Ala Thr Val Tyr Leu Ile Asp
 195 200 205
 Thr Val Leu Met Pro Pro Ala Ala Pro Gly Gly Thr Thr Glu Glu Gly
 210 215 220
 Pro Pro His Pro Ala Ser Pro
 225 230

<210> 153
 <211> 1125
 <212> DNA
 <213> Mycobacterium vaccae

<220>
 <221> unsure
 <222> (358)...(358)

<400> 153
 atgcaggtgc ggcgtgttct gggcagtgct ggtgcagcag tcgcggtttc ggccgcgtta 60
 tggcagacgg gggtttcgat accgaccgcc tcagcggatc cgtgtccgga catcgaggtg 120
 atcttcgcgc gcgggaccgg tgcggaaccc ggctcgggt gggtcggtga tgcgttcgtc 180
 aacgcgctgc ggcccaaggt cggtgagcag tcggtgggca cctacgcggt gaactaccgg 240
 gcaggattcg gacttcgaca aatcggcgcc catgggcgcg gccgacgcac cggggcgggt 300

```
gcagtggatg gccgacaact gcccgacac caagcttgtc ctgggcggca tgtcgcanng 360
cgccggcgtc atcgacctga tcaccgtcga tcccgacccg ctgggcgggt tcacccccac 420
cccgatgccg ccccgcgctc cccgaccagt ggccggcggt gtgggtcttcg gaaatccggt 480
gcgcgacatc cgtgggtggcg gtccgctgcc gcagatgagc ggcacctacg ggccgaagtc 540
gatcgatctg tgtgcgctcg acgatccggt ctgctcgccc ggcttcaacc tgccggccca 600
cttcgcctac gccgacaacg gcatgggtga ggaagcccg aacttcgccc gcctggaacc 660
gggccagagc gtcgagctgc ccgaggcgcc ctacctgcac ctgttcgtcc cgccggggcga 720
ggtaacgctg gaggacgccc gaccgctgcg cgaaggcgac gcagtgcgtt tcaccgcac 780
gggcgccag cggttgaccg ccaccgccc cgcggagatc ctgctctggg agatgcatgc 840
gggactcggg gggcgataag cgaataggag tctgtctggc cggcgagcga ctgctcgccg 900
gatgcacatc cgaacctgga cccgggccc cggcgccacc ggccccgacg agcacaaccg 960
agagcgacc cggtcccgga ctgctcccg tgaccgtcgc ggtcgacgaa cctctggccg 1020
acgcgccgtt cgaccagccc cgggagggcc tggtgcgcga ggggtggacg ctgtcggtgt 1080
ggcgcgccg cgcccgccc cggctggccg cgtgggcccc ggacg 1125
```

<210> 154

<211> 748

<212> PRT

<213> Mycobacterium vaccae

<220>

<221> UNSURE

<222> (119)...(119)

<400> 154

```
Met Gln Val Arg Arg Val Leu Gly Ser Val Gly Ala Ala Val Ala Val
1 5 10 15
Ser Ala Ala Leu Trp Gln Thr Gly Val Ser Ile Pro Thr Ala Ser Ala
20 25 30
Asp Pro Cys Pro Asp Ile Glu Val Ile Phe Ala Arg Gly Thr Gly Ala
35 40 45
Glu Pro Gly Leu Gly Trp Val Gly Asp Ala Phe Val Asn Ala Leu Arg
50 55 60
Pro Lys Val Gly Glu Gln Ser Val Gly Thr Tyr Ala Val Asn Tyr Pro
65 70 75 80
Ala Gly Phe Asp Phe Asp Lys Ser Ala Pro Met Gly Ala Ala Asp Ala
85 90 95
Ser Gly Arg Val Gln Trp Met Ala Asp Asn Cys Pro Asp Thr Lys Leu
100 105 110
Val Leu Gly Gly Met Ser Xaa Gly Ala Gly Val Ile Asp Leu Ile Thr
115 120 125
Val Asp Pro Arg Pro Leu Gly Arg Phe Thr Pro Thr Pro Met Pro Pro
130 135 140
Arg Val Ala Asp His Val Ala Ala Val Val Val Phe Gly Asn Pro Leu
145 150 155 160
Arg Asp Ile Arg Gly Gly Gly Pro Arg Leu Glu Pro Arg Gly Leu Asn
165 170 175
Met Glu Thr Ser Glu Arg Gly Leu Tyr Thr His Arg Thr Tyr Arg Gly
180 185 190
Leu Tyr Pro Arg Leu Tyr Ser Ser Glu Arg Ile Leu Glu Ala Ser Pro
195 200 205
Leu Glu Cys Tyr Ser Ala Leu Ala Leu Glu Ala Ser Pro Ala Ser Pro
210 215 220
Pro Arg Pro His Glu Cys Tyr Ser Ser Glu Arg Pro Arg Gly Leu Tyr
225 230 235 240
Pro His Glu Ala Ser Asn Leu Glu Pro Arg Ala Leu Ala His Ile Ser
245 250 255
```

| | | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Pro | His | Glu | Ala | Leu | Ala | Thr | Tyr | Arg | Ala | Leu | Ala | Ala | Ser | Pro | Ala | 260 | 265 | 270 |
| Ser | Asn | Gly | Leu | Tyr | Met | Glu | Thr | Val | Ala | Leu | Gly | Leu | Gly | Leu | Ala | 275 | 280 | 285 |
| Leu | Ala | Ala | Leu | Ala | Ala | Ser | Asn | Pro | His | Glu | Ala | Leu | Ala | Ala | Arg | 290 | 295 | 300 |
| Gly | Leu | Glu | Gly | Leu | Pro | Arg | Gly | Leu | Tyr | Gly | Leu | Asn | Ser | Glu | Arg | 305 | 310 | 315 |
| Val | Ala | Leu | Gly | Leu | Leu | Glu | Pro | Arg | Gly | Leu | Ala | Leu | Ala | Pro | Arg | 325 | 330 | 335 |
| Thr | Tyr | Arg | Leu | Glu | His | Ile | Ser | Leu | Glu | Pro | His | Glu | Val | Ala | Leu | 340 | 345 | 350 |
| Pro | Arg | Ala | Arg | Gly | Gly | Leu | Tyr | Gly | Leu | Val | Ala | Leu | Thr | His | Arg | 355 | 360 | 365 |
| Leu | Glu | Gly | Leu | Ala | Ser | Pro | Ala | Leu | Ala | Gly | Leu | Tyr | Pro | Arg | Leu | 370 | 375 | 380 |
| Glu | Ala | Arg | Gly | Gly | Leu | Gly | Leu | Tyr | Ala | Ser | Pro | Ala | Leu | Ala | Val | 385 | 390 | 395 |
| Ala | Leu | Ala | Arg | Gly | Pro | His | Glu | Thr | His | Arg | Ala | Leu | Ala | Ser | Glu | 405 | 410 | 415 |
| Arg | Gly | Leu | Tyr | Gly | Leu | Tyr | Gly | Leu | Asn | Ala | Arg | Gly | Val | Ala | Leu | 420 | 425 | 430 |
| Thr | His | Arg | Ala | Leu | Ala | Thr | His | Arg | Ala | Leu | Ala | Pro | Arg | Ala | Leu | 435 | 440 | 445 |
| Ala | Gly | Leu | Ile | Leu | Glu | Leu | Glu | Val | Ala | Leu | Thr | Arg | Pro | Gly | Leu | 450 | 455 | 460 |
| Met | Glu | Thr | His | Ile | Ser | Ala | Leu | Ala | Gly | Leu | Tyr | Leu | Glu | Gly | Leu | 465 | 470 | 475 |
| Tyr | Ala | Leu | Ala | Ala | Leu | Ala | Ala | Leu | Ala | Ala | Ser | Asn | Ala | Arg | Gly | 485 | 490 | 495 |
| Ser | Glu | Arg | Pro | Arg | Ala | Leu | Ala | Gly | Leu | Tyr | Ala | Arg | Gly | Ala | Arg | 500 | 505 | 510 |
| Gly | Ser | Glu | Arg | Thr | His | Arg | Ala | Leu | Ala | Ala | Arg | Gly | Ala | Arg | Gly | 515 | 520 | 525 |
| Met | Glu | Thr | His | Ile | Ser | Ile | Leu | Glu | Ala | Arg | Gly | Thr | His | Arg | Thr | 530 | 535 | 540 |
| Arg | Pro | Thr | His | Arg | Ala | Arg | Gly | Ala | Leu | Ala | Val | Ala | Leu | Gly | Leu | 545 | 550 | 555 |
| Tyr | Gly | Leu | Tyr | Thr | His | Arg | Gly | Leu | Tyr | Pro | Arg | Ala | Ser | Pro | Gly | 565 | 570 | 575 |
| Leu | His | Ile | Ser | Ala | Ser | Asn | Ala | Arg | Gly | Gly | Leu | Ala | Arg | Gly | Thr | 580 | 585 | 590 |
| His | Arg | Ala | Arg | Gly | Ser | Glu | Arg | Ala | Arg | Gly | Thr | His | Arg | Ala | Arg | 595 | 600 | 605 |
| Gly | Pro | Arg | Gly | Leu | Tyr | Ala | Ser | Pro | Ala | Arg | Gly | Ala | Arg | Gly | Gly | 610 | 615 | 620 |
| Leu | Tyr | Ala | Arg | Gly | Ala | Arg | Gly | Thr | His | Arg | Ser | Glu | Arg | Gly | Leu | 625 | 630 | 635 |
| Tyr | Ala | Arg | Gly | Ala | Arg | Gly | Ala | Leu | Ala | Val | Ala | Leu | Ala | Arg | Gly | 645 | 650 | 655 |
| Pro | Arg | Ala | Leu | Ala | Pro | Arg | Gly | Leu | Tyr | Gly | Leu | Tyr | Pro | Arg | Gly | 660 | 665 | 670 |
| Leu | Tyr | Ala | Leu | Ala | Ala | Leu | Ala | Gly | Leu | Tyr | Leu | Glu | Ala | Ser | Pro | 675 | 680 | 685 |
| Ala | Leu | Ala | Val | Ala | Leu | Gly | Leu | Tyr | Val | Ala | Leu | Gly | Leu | Tyr | Ala | 690 | 695 | 700 |
| Leu | Ala | Ala | Ser | Pro | Ala | Arg | Gly | Pro | Arg | Ala | Leu | Ala | Ala | Leu | Ala | | | |

705 710 715 720
 Ala Leu Ala Gly Leu Tyr Ala Arg Gly Val Ala Leu Gly Leu Tyr Pro
 725 730 735
 Arg Gly Leu Tyr Ala Arg Gly Pro Arg Gly Leu Tyr
 740 745

<210> 155
 <211> 666
 <212> DNA
 <213> Mycobacterium vaccae

<400> 155
 atgaaggcaa atcattcggg atgctacaaa tccgcgggcc cgatatgggc gcatccatcg 60
 ccgctttgtt cgcgcgcact ggcaccatct catgcaggtc tggacaatga gctgagcctg 120
 ggcattccacg gccagggccc ggaacgactg accattcagc agtgggacac cttcctcaac 180
 ggcgtcttcc cggttgaccg caaccggtg acccgaggag gggtccactc gggcaaggcg 240
 acctacgtcg tggccggtga aggtgccgac gagttcgagg gcacgctgga gctgggctac 300
 caggtgggct ttccgtggtc gctgggcgtg ggcattcaact tcagctacac caccgccaac 360
 atcacgtacg acgggttacg cctcaacttc gccagaccgc tgctgggctt cggtgattcc 420
 atcgtgaccc cgcgcgtgtt cccgggtgtc tccatcacgg cggacctggg caacggcccc 480
 ggcattccagg aggtcgcgac cttctccgtg gacgtggccg gcccggtgg ttccgtgggtg 540
 gtgtccaacg cgcacggcac ggtcaccggt gctgcgggtg gtgtgctgct gcgtccgttc 600
 gccgcctga tctcgtcgac cggcgacagc gtcaccacct acggcgacac ctggaacatg 660
 aactga 666

<210> 156
 <211> 221
 <212> PRT
 <213> Mycobacterium vaccae

<400> 156
 Met Lys Ala Asn His Ser Gly Cys Tyr Lys Ser Ala Gly Pro Ile Trp
 1 5 10 15
 Ser His Pro Ser Pro Leu Cys Ser Pro Ala Leu Ala Pro Ser His Ala
 20 25 30
 Gly Leu Asp Asn Glu Leu Ser Leu Gly Val His Gly Gln Gly Pro Glu
 35 40 45
 His Leu Thr Ile Gln Gln Trp Asp Thr Phe Leu Asn Gly Val Phe Pro
 50 55 60
 Leu Asp Arg Asn Arg Leu Thr Arg Glu Trp Phe His Ser Gly Lys Ala
 65 70 75 80
 Thr Tyr Val Val Ala Gly Glu Gly Ala Asp Glu Phe Glu Gly Thr Leu
 85 90 95
 Glu Leu Gly Tyr His Val Gly Phe Pro Trp Ser Leu Gly Val Gly Ile
 100 105 110
 Asn Phe Ser Tyr Thr Thr Pro Asn Ile Thr Tyr Asp Gly Tyr Gly Leu
 115 120 125
 Asn Phe Ala Asp Pro Leu Leu Gly Phe Gly Asp Ser Ile Val Thr Pro
 130 135 140
 Pro Leu Phe Pro Gly Val Ser Ile Thr Ala Asp Leu Gly Asn Gly Pro
 145 150 155 160
 Gly Ile Gln Glu Val Ala Thr Phe Ser Val Asp Val Ala Gly Pro Gly
 165 170 175
 Gly Ser Val Val Val Ser Asn Ala His Gly Thr Val Thr Gly Ala Ala
 180 185 190
 Gly Gly Val Leu Leu Arg Pro Phe Ala Arg Leu Ile Ser Ser Thr Gly
 195 200 205

Asp Ser Val Thr Thr Tyr Gly Ala Pro Trp Asn Met Asn
 210 215 220

<210> 157
 <211> 480
 <212> DNA
 <213> Mycobacterium vaccae

<400> 157

| | | | | | | |
|------------|-------------|------------|------------|------------|------------|-----|
| aacggctggg | acatcaacac | ccctgcgttc | gagtggttct | acgagtcagg | cttgctgacg | 60 |
| atcatgccgg | tggcgaggaca | gtccagcttc | tacagcgact | ggtaccagcc | gtctcggggc | 120 |
| aacgggcaga | actacaccta | caagtgggag | acgttcctga | cccaggagct | gccgacgtgg | 180 |
| ctggaggcca | accgcggagt | gtcgcgcacc | ggcaacgcgt | tcgtcggcct | gtcgatggcg | 240 |
| ggcagcgagg | cgctgaccta | cgcgatccat | caccgcgagc | agttcatcta | cgctcgtcg | 300 |
| ctgtcaggct | tcctgaaccc | gtccgagggc | tggtggccga | tgctgatcgg | gctggcgatg | 360 |
| aacgacgcag | gcggtttcaa | cgccgagagc | atgtggggcc | cgctctcgga | cccggcggtg | 420 |
| aagcgcaacg | acccgatggg | caacatcaac | cagctggtgg | ccaacaacac | ccggatctgg | 480 |

<210> 158
 <211> 161
 <212> PRT
 <213> Mycobacterium vaccae

<400> 158

| | | | |
|-----------------|-----------------|-----------------|-----------------|
| Asn Gly Trp Asp | Ile Asn Thr Pro | Ala Phe Glu Trp | Phe Tyr Glu Ser |
| 1 5 10 15 | | | |
| Gly Leu Ser Thr | Ile Met Pro Val | Gly Gly Gln Ser | Ser Phe Tyr Ser |
| 20 25 30 | | | |
| Asp Trp Tyr Gln | Pro Ser Arg Gly | Asn Gly Gln Asn | Tyr Thr Tyr Lys |
| 35 40 45 | | | |
| Trp Glu Thr Phe | Leu Thr Gln Glu | Leu Pro Thr Trp | Leu Glu Ala Asn |
| 50 55 60 | | | |
| Arg Gly Val Ser | Arg Thr Gly Asn | Ala Phe Val Gly | Leu Ser Met Ala |
| 65 70 75 80 | | | |
| Gly Ser Ala Ala | Leu Thr Tyr Ala | Ile His His Pro | Gln Gln Phe Ile |
| 85 90 95 | | | |
| Tyr Ala Ser Ser | Leu Ser Gly Phe | Leu Asn Pro Ser | Glu Gly Trp Trp |
| 100 105 110 | | | |
| Pro Met Leu Ile | Gly Leu Ala Met | Asn Asp Ala Gly | Gly Phe Asn Ala |
| 115 120 125 | | | |
| Glu Ser Met Trp | Gly Pro Ser Ser | Asp Pro Ala Trp | Lys Arg Asn Asp |
| 130 135 140 | | | |
| Pro Met Val Asn | Ile Asn Gln Leu | Val Ala Asn Asn | Thr Arg Ile Trp |
| 145 150 155 160 | | | |
| Ile | | | |

<210> 159
 <211> 1626
 <212> DNA
 <213> Mycobacterium vaccae

<400> 159

| | | | | | | |
|------------|------------|------------|-------------|------------|------------|-----|
| atggccaaga | caattgcgta | tgacgaagag | gcccgcctgtg | gcctcgagcg | gggcctcaac | 60 |
| gccctcgag | acgccgtaaa | ggtagcgttg | ggcccgaagg | gtcgcaacgt | cgtgctggag | 120 |
| aagaagtggg | gcgccccac | gatcaccaac | gatggtgtgt | ccatcgccaa | ggagatcgag | 180 |
| ctggaggacc | cgtacgagaa | gatcggcgct | gagctggtca | aagaggtcgc | caagaagacc | 240 |

```

gacgacgtcg cgggcgacgg caccaccacc gccaccgtgc tcgctcaggc tctggttcgc      300
gaaggcctgc gcaacgtcgc agccggcgcc aaccgcgtcg gcctcaagcg tggcatcgag      360
aaggctgtcg aggctgtcac ccagtcgctg ctgaagtcgg ccaaggaggt cgagaccaag      420
gagcagattt ctgccaccgc ggcgatttcc gccggcgaca cccagatcgg cgagctcatc      480
gccgaggcca tggacaaggt cggcaacgag ggtgtcatca ccgtcgagga gtcgaacacc      540
ttcggcctgc agctcgagct caccgaggtg atgcgcttcg acaagggtta catctcgggt      600
tacttcgtga ccgacgccga gcgccaggaa gccgtcctgg aggatcccta catcctgctg      660
gtcagctcca aggtgtcgac cgtcaaggat ctgctcccgc tgctggagaa ggcatccag      720
gccggcaagc cgtgtgtgat catcgccgag gacgtcgagg gcgaggccct gtccacgctg      780
gtggtcaaca agatccgcgg caccttcaag tccgtcgccg tcaaggctcc gggcttcggg      840
gaccgccgca aggcgatgct gcaggacatg gccatcccta ccggtggtca ggtcgtcagc      900
gaaagagtcg ggctgtccct ggagaccgcc gacgtctcgc tgctgggcca gggccgcaag      960
gtcgtcgtca ccaaggacga gaccaccatc gtcgaggggt cgggcgattc cgatgccatc     1020
gccggccggg tggctcagat ccgcgccgag atcgagaaca gcgactccga ctacgaccgc     1080
gagaagctgc aggagcgctt ggccaagctg gccggcggtg ttgctggtgat caaggccgga     1140
gctgccaccg aggtggagct caaggagcgc aagcaccgca tcgaggacgc cgtccgcaac     1200
gcgaaggctg ccgtcgaaga gggcatcgct gccgggtggcg gcgtggctct gctgcagtcg     1260
gtcctgcgcg tggacgacct cggcctgacg ggcgacgagg ccaccggtgc caacatcgtc     1320
cgcgtggcgc tgtcgggtcc gctcaagcag atgccttca acggcggcct ggagcccggc     1380
gtcgttgccg agaaggtgtc caacctgccc gcgggtcacg gcctcaacgc cgcgaccggt     1440
gagtacgagg acctgctcaa ggccggcgct gccgaccggg tgaaggtcac ccgctcggcg     1500
ctgcagaacg cggcgtccat cgcggctctg ttccctacca ccgaggccgt cgtcgccgac     1560
aagccggaga aggcgtccgc acccgcgggc gaccgcaccg gtggcatggg cggtatggac     1620
ttctaa

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```

<210> 160
<211> 541
<212> PRT
<213> Mycobacterium vaccae

```

```

<400> 160
Met Ala Lys Thr Ile Ala Tyr Asp Glu Glu Ala Arg Arg Gly Leu Glu
 1           5           10          15
Arg Gly Leu Asn Ala Leu Ala Asp Ala Val Lys Val Thr Leu Gly Pro
 20          25          30
Lys Gly Arg Asn Val Val Leu Glu Lys Lys Trp Gly Ala Pro Thr Ile
 35          40          45
Thr Asn Asp Gly Val Ser Ile Ala Lys Glu Ile Glu Leu Glu Asp Pro
 50          55          60
Tyr Glu Lys Ile Gly Ala Glu Leu Val Lys Glu Val Ala Lys Lys Thr
 65          70          75          80
Asp Asp Val Ala Gly Asp Gly Thr Thr Thr Ala Thr Val Leu Ala Gln
 85          90          95
Ala Leu Val Arg Glu Gly Leu Arg Asn Val Ala Ala Gly Ala Asn Pro
 100         105         110
Leu Gly Leu Lys Arg Gly Ile Glu Lys Ala Val Glu Ala Val Thr Gln
 115         120         125
Ser Leu Leu Lys Ser Ala Lys Glu Val Glu Thr Lys Glu Gln Ile Ser
 130         135         140
Ala Thr Ala Ala Ile Ser Ala Gly Asp Thr Gln Ile Gly Glu Leu Ile
 145         150         155         160
Ala Glu Ala Met Asp Lys Val Gly Asn Glu Gly Val Ile Thr Val Glu
 165         170         175
Glu Ser Asn Thr Phe Gly Leu Gln Leu Glu Leu Thr Glu Gly Met Arg
 180         185         190
Phe Asp Lys Gly Tyr Ile Ser Gly Tyr Phe Val Thr Asp Ala Glu Arg
 195         200         205

```


Gln Glu Ala Val Leu Glu Asp Pro Tyr Ile Leu Leu Val Ser Ser Lys
 210 215 220
 Val Ser Thr Val Lys Asp Leu Leu Pro Leu Leu Glu Lys Val Ile Gln
 225 230 235 240
 Ala Gly Lys Pro Leu Leu Ile Ile Ala Glu Asp Val Glu Gly Glu Ala
 245 250 255
 Leu Ser Thr Leu Val Val Asn Lys Ile Arg Gly Thr Phe Lys Ser Val
 260 265 270
 Ala Val Lys Ala Pro Gly Phe Gly Asp Arg Arg Lys Ala Met Leu Gln
 275 280 285
 Asp Met Ala Ile Leu Thr Gly Gly Gln Val Val Ser Glu Arg Val Gly
 290 295 300
 Leu Ser Leu Glu Thr Ala Asp Val Ser Leu Leu Gly Gln Ala Arg Lys
 305 310 315 320
 Val Val Val Thr Lys Asp Glu Thr Thr Ile Val Glu Gly Ser Gly Asp
 325 330 335
 Ser Asp Ala Ile Ala Gly Arg Val Ala Gln Ile Arg Ala Glu Ile Glu
 340 345 350
 Asn Ser Asp Ser Asp Tyr Asp Arg Glu Lys Leu Gln Glu Arg Leu Ala
 355 360 365
 Lys Leu Ala Gly Gly Val Ala Val Ile Lys Ala Gly Ala Ala Thr Glu
 370 375 380
 Val Glu Leu Lys Glu Arg Lys His Arg Ile Glu Asp Ala Val Arg Asn
 385 390 395 400
 Ala Lys Ala Ala Val Glu Glu Gly Ile Val Ala Gly Gly Gly Val Ala
 405 410 415
 Leu Leu Gln Ser Ala Pro Ala Leu Asp Asp Leu Gly Leu Thr Gly Asp
 420 425 430
 Glu Ala Thr Gly Ala Asn Ile Val Arg Val Ala Leu Ser Ala Pro Leu
 435 440 445
 Lys Gln Ile Ala Phe Asn Gly Gly Leu Glu Pro Gly Val Val Ala Glu
 450 455 460
 Lys Val Ser Asn Leu Pro Ala Gly His Gly Leu Asn Ala Ala Thr Gly
 465 470 475 480
 Glu Tyr Glu Asp Leu Leu Lys Ala Gly Val Ala Asp Pro Val Lys Val
 485 490 495
 Thr Arg Ser Ala Leu Gln Asn Ala Ala Ser Ile Ala Ala Leu Phe Leu
 500 505 510
 Thr Thr Glu Ala Val Val Ala Asp Lys Pro Glu Lys Ala Ser Ala Pro
 515 520 525
 Ala Gly Asp Pro Thr Gly Gly Met Gly Gly Met Asp Phe
 530 535 540

<210> 161
 <211> 985
 <212> DNA
 <213> Mycobacterium vaccae

<400> 161

| | |
|--|-----|
| ggatccctac atcctgctgg tcagctccaa ggtgtcgacc gtcaaggatc tgctcccgcg | 60 |
| gctggagaag gtcattccagg ccggcaagcc gctgctgac atcgccgagg acgtcgaggg | 120 |
| cgaggccctg tccacgctgg tggtaacaa gatccgcggc accttcaagt ccgtcgccgt | 180 |
| caaggctccg ggcttcggg accgccgcaa ggcgatgctg caggacatgg ccattcctac | 240 |
| cggtgggtcag gtcgtcagcg aaagagtcgg gctgtccctg gagaccgccg acgtctcgct | 300 |
| gctggggccag gccgcgaagg tcgtcgtcac caaggacgag accaccatcg tcgagggctc | 360 |
| gggagattcc gatgccatcg ccggccgggt ggctcagatc cgcgcgcgaga tcgagaacag | 420 |
| cgactccgac tacgaccgcg agaagctgca ggagcgcctg gccaaagctgg ccggcggtgt | 480 |

[illegible]

<400> 162

66

325

<210> 163
<211> 403
<212> DNA
<213> Mycobacterium vaccae

<400> 163

| | | | | | | | |
|------------|-------------|------------|-------------|------------|------------|------------|-----|
| ggatccg | cgg | caccggctgg | tgacgaccaa | gtacaacccg | gcccgcacct | ggacggccga | 60 |
| gaactccgtc | ggcatcggcg | gcgcgtacct | gtgcatctac | gggatggagg | gccccggcgg | | 120 |
| ctatcagttc | gtcggccgca | ccaccaggt | gtggagtcgt | taccgccaca | cggcgcggtt | | 180 |
| cgaacccgga | agtccctggc | tgctgcggtt | tttcgaccga | atttcgtggt | atccggtgtc | | 240 |
| ggccgaggag | ctgctggaat | tgcgagccga | catggccgca | ggccggggct | cggtcgacat | | 300 |
| caccgacggc | gtgtttctccc | tcgccgagca | cgaacgggttc | ctggccgaca | acgccgacga | | 360 |
| catcgccgcg | ttccgttccc | ggcaggcggc | cgcgtttctcc | gcc | | | 403 |

<210> 164
<211> 336
<212> DNA
<213> Mycobacterium vaccae

<400> 164

| | | | | | | | |
|-------------|-------------|------------|-------------|------------|------------|------------|-----|
| cggaccgcgt | ggg | cggccgc | cggcgagttc | gaccgcg | agaaagccgc | gtcgaaggcc | 60 |
| accgacgccg | ataccgggga | cctggtgctc | tacgacggtg | cgagcgggtc | gacgctccgt | | 120 |
| tcgcgtcgag | cgtgtggaag | gtcgacgtcg | ccgtcgggtga | ccgggtggtg | gccggacagc | | 180 |
| cgttgctggc | gctggaggcg | atgaagatgg | agaccgtgct | gcgcgccccg | gccgacgggg | | 240 |
| tggtcaccoca | gatacctggtc | tccgctgggc | atctcgtcga | tcccggcacc | ccactggtcg | | 300 |
| tggtcggcaac | cggagtg | gcgc | gcatgagcgc | cgtcga | | | 336 |

<210> 165
<211> 134
<212> PRT
<213> Mycobacterium vaccae

<400> 165

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asp | Pro | Arg | His | Arg | Leu | Val | Thr | Thr | Lys | Tyr | Asn | Pro | Ala | Arg | Thr |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Trp | Thr | Ala | Glu | Asn | Ser | Val | Gly | Ile | Gly | Gly | Ala | Tyr | Leu | Cys | Ile |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Tyr | Gly | Met | Glu | Gly | Pro | Gly | Gly | Tyr | Gln | Phe | Val | Gly | Arg | Thr | Thr |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Gln | Val | Trp | Ser | Arg | Tyr | Arg | His | Thr | Ala | Pro | Phe | Glu | Pro | Gly | Ser |
| | | 50 | | | | 55 | | | | | 60 | | | | |
| Pro | Trp | Leu | Leu | Arg | Phe | Phe | Asp | Arg | Ile | Ser | Trp | Tyr | Pro | Val | Ser |
| 65 | | | | 70 | | | | | 75 | | | | | 80 | |
| Ala | Glu | Glu | Leu | Leu | Glu | Leu | Arg | Ala | Asp | Met | Ala | Ala | Gly | Arg | Gly |
| | | | 85 | | | | | 90 | | | | | 95 | | |
| Ser | Val | Asp | Ile | Thr | Asp | Gly | Val | Phe | Ser | Leu | Ala | Glu | His | Glu | Arg |
| | | 100 | | | | | 105 | | | | | 110 | | | |
| Phe | Leu | Ala | Asp | Asn | Ala | Asp | Asp | Ile | Ala | Ala | Phe | Arg | Ser | Arg | Gln |
| | | 115 | | | | 120 | | | | | | 125 | | | |
| Ala | Ala | Ala | Phe | Ser | Ala | | | | | | | | | | |
| 130 | | | | | | | | | | | | | | | |

<210> 166
<211> 108
<212> PRT

<213> Mycobacterium vaccae

<400> 166

Arg Thr Ala Trp Ala Ala Ala Gly Glu Phe Asp Arg Ala Glu Lys Ala
1 5 10 15
Ala Ser Lys Ala Thr Asp Ala Asp Thr Gly Asp Leu Val Leu Tyr Asp
20 25 30
Gly Asp Glu Arg Val Asp Ala Pro Phe Ala Ser Ser Val Trp Lys Val
35 40 45
Asp Val Ala Val Gly Asp Arg Val Val Ala Gly Gln Pro Leu Leu Ala
50 55 60
Leu Glu Ala Met Lys Met Glu Thr Val Leu Arg Ala Pro Ala Asp Gly
65 70 75 80
Val Val Thr Gln Ile Leu Val Ser Ala Gly His Leu Val Asp Pro Gly
85 90 95
Thr Pro Leu Val Val Val Gly Thr Gly Val Arg Ala
100 105

<210> 167

<211> 31

<212> DNA

<213> Artificial Sequence

<220>

<223> Made in a lab

<400> 167

atagaattcg tccgacagtg ggacctcgag c

31

<210> 168

<211> 27

<212> DNA

<213> Artificial Sequence

<220>

<223> Made in a lab

<400> 168

atagaattcc caccgcgtca gccgccg

27

<210> 169

<211> 1111

<212> DNA

<213> Mycobacterium vaccae

<400> 169

| | | | | | | |
|------------|------------|------------|------------|------------|------------|-----|
| gtccgacagt | gggacctcga | gcaccacgtc | acaggacagc | ggccccgcca | gcggcgccct | 60 |
| gcgcgtctcc | aactggccgc | tctatatggc | cgacggtttc | atcgagcgt | tccagaccgc | 120 |
| ctcgggcac | acggctgact | acaaagaaga | cttcaacgac | aacgagcagt | ggttcgccaa | 180 |
| ggccaaggag | ccgttgctgc | gcaagcagga | cataggcgcc | gacctggtga | tccccaccga | 240 |
| gttcatggcc | gcgcgcgtca | agggcctggg | atggctcaat | gagatcagcg | aagccggcgt | 300 |
| gccaatcgc | aagaatctgc | gtcaggacct | gttgactcg | agcatcgacg | agggccgcaa | 360 |
| gttcaccgcg | ccgtacatga | ccggcatggg | cggtctcgcc | tacaacaagg | cagccaccgg | 420 |
| acgcgatatc | cgcaccatcg | acgacctctg | ggatcccgcg | ttcaagggcc | gcgtcagtct | 480 |
| gttctccgac | gtccaggacg | gcctcggcac | gatcatgctc | tcgcagggca | actcgccgga | 540 |
| gaatccgacc | accgagtcca | ttcagcaggc | ggtcgatctg | gtccgcgaac | agaacgacag | 600 |
| ggggtcagat | ccgtcgcttc | accggcaacg | actacgccga | cgacctggcc | gcagaaacat | 660 |

```

cgccatcgcg caggcgact cgggtgacgt cgtgcagctg caggcggaca accccgatct 720
gcagttcatc gttcccgaat ccggcggcga ctggttcgtc gacacgatgg tgatccccta 780
caccacgcag aaccagaagg ccgccgaggc gtggatcgac tacatctacg accgagccaa 840
ctacgccaag ctggtcgcgt tcacccagtt cgtgcccga ctctcggaca tgaccgacga 900
actcgccaag gtcgatcctg catcggcgga gaaccgcgt atcaaccgt cggccgaggt 960
gcaggcgaac ctgaagtctg gggcggcact gaccgacgag cagacgcagg agttcaacac 1020
tgcgtacgcc gccgtcaccg gcggctgacg cggtggtagt gccgatgcga ggggcataaa 1080
tggccctgcg gacgcgagga gcataaatgg c 1111

```

<210> 170

<211> 348

<212> PRT

<213> Mycobacterium vaccae

<400> 170

```

Ser Asp Ser Gly Thr Ser Ser Thr Thr Ser Gln Asp Ser Gly Pro Ala
1      5      10      15
Ser Gly Ala Leu Arg Val Ser Asn Trp Pro Leu Tyr Met Ala Asp Gly
20     25     30
Phe Ile Ala Ala Phe Gln Thr Ala Ser Gly Ile Thr Val Asp Tyr Lys
35     40     45
Glu Asp Phe Asn Asp Asn Glu Gln Trp Phe Ala Lys Val Lys Glu Pro
50     55     60
Leu Ser Arg Lys Gln Asp Ile Gly Ala Asp Leu Val Ile Pro Thr Glu
65     70     75     80
Phe Met Ala Ala Arg Val Lys Gly Leu Gly Trp Leu Asn Glu Ile Ser
85     90     95
Glu Ala Gly Val Pro Asn Arg Lys Asn Leu Arg Gln Asp Leu Leu Asp
100    105    110
Ser Ser Ile Asp Glu Gly Arg Lys Phe Thr Ala Pro Tyr Met Thr Gly
115    120    125
Met Val Gly Leu Ala Tyr Asn Lys Ala Ala Thr Gly Arg Asp Ile Arg
130    135    140
Thr Ile Asp Asp Leu Trp Asp Pro Ala Phe Lys Gly Arg Val Ser Leu
145    150    155    160
Phe Ser Asp Val Gln Asp Gly Leu Gly Met Ile Met Leu Ser Gln Gly
165    170    175
Asn Ser Pro Glu Asn Pro Thr Thr Glu Ser Ile Gln Gln Ala Val Asp
180    185    190
Leu Val Arg Glu Gln Asn Asp Arg Gly Gln Ile Arg Arg Phe Thr Gly
195    200    205
Asn Asp Tyr Ala Asp Asp Leu Ala Ala Gly Asn Ile Ala Ile Ala Gln
210    215    220
Ala Tyr Ser Gly Asp Val Val Gln Leu Gln Ala Asp Asn Pro Asp Leu
225    230    235    240
Gln Phe Ile Val Pro Glu Ser Gly Gly Asp Trp Phe Val Asp Thr Met
245    250    255
Val Ile Pro Tyr Thr Thr Gln Asn Gln Lys Ala Ala Glu Ala Trp Ile
260    265    270
Asp Tyr Ile Tyr Asp Arg Ala Asn Tyr Ala Lys Leu Val Ala Phe Thr
275    280    285
Gln Phe Val Pro Ala Leu Ser Asp Met Thr Asp Glu Leu Ala Lys Val
290    295    300
Asp Pro Ala Ser Ala Glu Asn Pro Leu Ile Asn Pro Ser Ala Glu Val
305    310    315    320
Gln Ala Asn Leu Lys Ser Trp Ala Ala Leu Thr Asp Glu Gln Thr Gln
325    330    335

```

Glu Phe Asn Thr Ala Tyr Ala Ala Val Thr Gly Gly
340 345

<210> 171
<211> 1420
<212> DNA
<213> Mycobacterium vaccae

<220>
<221> unsure
<222> (955)...(955)

<221> unsure
<222> (973)...(973)

<400> 171

| | | | | | | |
|------------|-------------|------------|-------------|-------------|-------------|------|
| gatgagcagc | gtgctgaact | cgacctgggt | ggcctgggccc | gtcgcggtcg | cggtcggggtt | 60 |
| cccggtgctg | ctggctcgtg | tgaccgaggt | gcacaacgcg | ttgcgtcggc | gcggcagcgc | 120 |
| gctggcccgc | cgggtgcaac | tcctgcgtac | ctacatcctg | ccgctgggcg | cgttgctgct | 180 |
| cctgctggta | caggcgatgg | agatctccga | cgacgccacg | tcggtagcgt | tggtcggccac | 240 |
| cctgttcggc | gtcgtgttgt | tgacgttggt | gctgtccggg | ctcaacgcca | ccctcatcca | 300 |
| gggcgcacca | gaagacagct | ggcgcaggcg | gattccgtcg | atcttcctcg | acgtcgcgcg | 360 |
| cttcgcgctg | atcgcggtcg | gtatcaccgt | gatcatggcc | tatgtctggg | gcgcgaacgt | 420 |
| ggggggcctg | ttcaccgcac | tgggcgtcac | ttccatcggt | cttggcctgg | ctctgcagaa | 480 |
| ttcgtcgggt | cagatcatct | cgggtctgct | gctgctgttc | gagcaaccgt | tccggctcgg | 540 |
| cgactggatc | accgtcccca | ccgcggcggg | ccggccgtcc | gcccacggcc | gcgtggtgga | 600 |
| agtcaactgg | cgtgcaacac | atatcgacac | cggcggcaac | ctgctggtaa | tgcccaacgc | 660 |
| cgaactcgcc | ggcgcgtcgt | tcaccaatta | cagccggccc | gtgggagagc | accggctgac | 720 |
| cgtcgtcacc | accttcaacg | ccgcggacac | ccccgatgat | gtctgcgaga | tgctgtcgtc | 780 |
| ggtcgcggcg | tcgctgcccg | aactgcgcac | cgacggacag | atcgccacgc | tctatctcgg | 840 |
| tgcggccgaa | tacgagaagt | cgatcccggt | gcacacaccc | gcgggtggacg | actcggtcag | 900 |
| gagcacgtac | ctgcgatggg | tctggtacgc | cgcgcgcggg | caggaacttc | gcctnaacgg | 960 |
| cgtcgccgac | ganttcgaca | cgccggaacg | gatcgccctg | gccatgcggg | ctgtggcgctc | 1020 |
| cacactgcgc | ttggcagacg | acgaacagca | ggagatcgcc | gacgtggtgc | gtctgggtccg | 1080 |
| ttacggcaac | ggggaacgcc | tccagcagcc | gggtcaggta | ccgaccggga | tgaggttcat | 1140 |
| cgtagacggc | aggggtgagtc | tgtccgtgat | cgatcaggac | ggcgacgtga | tcccggcgcg | 1200 |
| ggtgctcgag | cgtggcgact | tcctggggca | gaccacgctg | acgcgggaac | cgggtactggc | 1260 |
| gaccgcgcac | gcgctggagg | aagtaccctg | gctggagatg | gcccgtagcg | agatcgagcg | 1320 |
| cctggtgcac | cgaaagccga | tcctgctgca | cgtgatcggg | gccgtgatcg | ccgaccggcg | 1380 |
| gcgcgacgaa | cttcggttga | tggcggactc | gcaggactga | | | 1420 |

<210> 172
<211> 471
<212> PRT
<213> Mycobacterium vaccae

<220>
<221> UNSURE
<222> (318)...(318)

<221> UNSURE
<222> (324)...(324)

<400> 172

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Ser | Ser | Val | Leu | Asn | Ser | Thr | Trp | Leu | Ala | Trp | Ala | Val | Ala | Val |
| 1 | | | | 5 | | | | 10 | | | | | 15 | | |
| Ala | Val | Gly | Phe | Pro | Val | Leu | Leu | Val | Val | Leu | Thr | Glu | Val | His | Asn |

| | | | | | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|----|--|--|--|--|
| | | | 20 | | | | | | | 25 | | | | | | | 30 | | | | |
| Ala | Leu | Arg | Arg | Arg | Gly | Ser | Ala | Leu | Ala | Arg | Pro | Val | Gln | Leu | Leu | | | | | | |
| | | 35 | | | | | 40 | | | | | 45 | | | | | | | | | |
| Arg | Thr | Tyr | Ile | Leu | Pro | Leu | Gly | Ala | Leu | Leu | Leu | Leu | Leu | Val | Gln | | | | | | |
| | 50 | | | | | 55 | | | | | 60 | | | | | | | | | | |
| Ala | Met | Glu | Ile | Ser | Asp | Asp | Ala | Thr | Ser | Val | Arg | Leu | Val | Ala | Thr | | | | | | |
| 65 | | | | | 70 | | | | | 75 | | | | 80 | | | | | | | |
| Leu | Phe | Gly | Val | Val | Leu | Leu | Thr | Leu | Val | Leu | Ser | Gly | Leu | Asn | Ala | | | | | | |
| | | | | 85 | | | | | 90 | | | | | 95 | | | | | | | |
| Thr | Leu | Ile | Gln | Gly | Ala | Pro | Glu | Asp | Ser | Trp | Arg | Arg | Arg | Ile | Pro | | | | | | |
| | | | 100 | | | | | 105 | | | | | 110 | | | | | | | | |
| Ser | Ile | Phe | Leu | Asp | Val | Ala | Arg | Phe | Ala | Leu | Ile | Ala | Val | Gly | Ile | | | | | | |
| | | 115 | | | | | 120 | | | | | 125 | | | | | | | | | |
| Thr | Val | Ile | Met | Ala | Tyr | Val | Trp | Gly | Ala | Asn | Val | Gly | Gly | Leu | Phe | | | | | | |
| | 130 | | | | | 135 | | | | | 140 | | | | | | | | | | |
| Thr | Ala | Leu | Gly | Val | Thr | Ser | Ile | Val | Leu | Gly | Leu | Ala | Leu | Gln | Asn | | | | | | |
| 145 | | | | | 150 | | | | | 155 | | | | 160 | | | | | | | |
| Ser | Val | Gly | Gln | Ile | Ile | Ser | Gly | Leu | Leu | Leu | Leu | Phe | Glu | Gln | Pro | | | | | | |
| | | | | 165 | | | | | 170 | | | | | 175 | | | | | | | |
| Phe | Arg | Leu | Gly | Asp | Trp | Ile | Thr | Val | Pro | Thr | Ala | Ala | Gly | Arg | Pro | | | | | | |
| | | | 180 | | | | | 185 | | | | | 190 | | | | | | | | |
| Ser | Ala | His | Gly | Arg | Val | Val | Glu | Val | Asn | Trp | Arg | Ala | Thr | His | Ile | | | | | | |
| | | 195 | | | | | 200 | | | | | 205 | | | | | | | | | |
| Asp | Thr | Gly | Gly | Asn | Leu | Leu | Val | Met | Pro | Asn | Ala | Glu | Leu | Ala | Gly | | | | | | |
| | 210 | | | | | 215 | | | | | 220 | | | | | | | | | | |
| Ala | Ser | Phe | Thr | Asn | Tyr | Ser | Arg | Pro | Val | Gly | Glu | His | Arg | Leu | Thr | | | | | | |
| 225 | | | | | 230 | | | | | 235 | | | | 240 | | | | | | | |
| Val | Val | Thr | Thr | Phe | Asn | Ala | Ala | Asp | Thr | Pro | Asp | Asp | Val | Cys | Glu | | | | | | |
| | | | | 245 | | | | | 250 | | | | | 255 | | | | | | | |
| Met | Leu | Ser | Ser | Val | Ala | Ala | Ser | Leu | Pro | Glu | Leu | Arg | Thr | Asp | Gly | | | | | | |
| | | | 260 | | | | | 265 | | | | | 270 | | | | | | | | |
| Gln | Ile | Ala | Thr | Leu | Tyr | Leu | Gly | Ala | Ala | Glu | Tyr | Glu | Lys | Ser | Ile | | | | | | |
| | | 275 | | | | | 280 | | | | | 285 | | | | | | | | | |
| Pro | Leu | His | Thr | Pro | Ala | Val | Asp | Asp | Ser | Val | Arg | Ser | Thr | Tyr | Leu | | | | | | |
| | 290 | | | | | 295 | | | | | 300 | | | | | | | | | | |
| Arg | Trp | Val | Trp | Tyr | Ala | Ala | Arg | Arg | Gln | Glu | Leu | Arg | Xaa | Asn | Gly | | | | | | |
| 305 | | | | | 310 | | | | | 315 | | | | 320 | | | | | | | |
| Val | Ala | Asp | Xaa | Phe | Asp | Thr | Pro | Glu | Arg | Ile | Ala | Ser | Ala | Met | Arg | | | | | | |
| | | | | 325 | | | | | 330 | | | | | 335 | | | | | | | |
| Ala | Val | Ala | Ser | Thr | Leu | Arg | Leu | Ala | Asp | Asp | Glu | Gln | Gln | Glu | Ile | | | | | | |
| | | | 340 | | | | | 345 | | | | | 350 | | | | | | | | |

<210> 173
 <211> 2172
 <212> DNA
 <213> Mycobacterium vaccae

<400> 173

| | | | | | | |
|-------------|-------------|-------------|-------------|-------------|-------------|------|
| tagatgacaa | ttctgcccctg | gaatgcgcga | acgtctgaac | accgcgacgcg | aaaaagacgc | 60 |
| gggcgctacc | acctcctgtc | gcggatgagc | atccagtgcca | agttgctgct | gatgctgctt | 120 |
| ctgaccagca | ttctctcggc | tgcggtgggtc | ggtttcacgc | gctatcagtc | cggacggtcc | 180 |
| tcgctgcgcg | catcggtggt | cgaccgcctc | accgacatcc | gcgagtcgca | gtcgcgcggg | 240 |
| ttggagaatc | agttcgcgga | cctgaagaac | tcgatgggtga | tttactcgcg | cggcagcaact | 300 |
| gccacggagg | cgatcggcgc | gttcagcgac | ggtttcgcgc | agctcggcga | tgcgacgac | 360 |
| aataccgggc | aggcggcgc | attgcgcgc | tactacgacc | ggacgttcgc | caacaccacc | 420 |
| ctcgacgaca | gcggaaacgc | cgtcgacgtc | cgcgcgctca | tcccgaac | caacccccag | 480 |
| cgctatctgc | aggcgctcta | tacccgcgc | tttcagaact | gggagaaggc | gatcgcgctt | 540 |
| gacgacgcgc | gcgacggcag | cgccctggctg | gccgccaatg | ccagattcaa | cgagttcttc | 600 |
| cgcgagatcg | tgcaccgctt | caacttcgag | gatctgatgc | tgctcgacct | cgagggcaac | 660 |
| gtgggtgtact | ccgcctacaa | ggggccggat | ctcgggacaa | acatcgctca | cggcccctat | 720 |
| cgcaaccggg | aactgtcgga | agcctacgag | aaggcggtcg | cgtcgaactc | gatcgactat | 780 |
| gtcgggtgtca | ccgacttcgg | gtgggtacctg | cctgccgagg | aaccgaccgc | ctgggtcctg | 840 |
| tcccgcgtcg | ggttgaagga | ccgagtcgac | gggtgtgatg | cgggtccagtt | cccgatcgcg | 900 |
| cggatcaacg | aattgatgac | ggcgcgggga | cagtggcggtg | acaccgggat | gggagacacc | 960 |
| ggtgagacca | tcctgggtcgg | accggacaat | ctgatgcgct | cggactcccg | gctgttccgc | 1020 |
| gagaaccggg | agaagttcct | ggccgacgtc | gtcgaggggg | gaaccccgcc | ggaggtcgcc | 1080 |
| gacgaatcgg | ttgaccgccc | cggcaccacg | ctgggtgcagc | cgggtgaccac | ccgctccgct | 1140 |
| gaggaggccc | aacgcggcaa | caccgggacg | acgatcgagg | acgactatct | cggccacgag | 1200 |
| gcgttacagg | cgtactcacc | ggtggacctg | ccgggactgc | actgggtgat | cgtggccaag | 1260 |
| atcgacaccg | acgaggcggt | cgccccgggtg | gcgcagttca | ccaggaccct | ggtgctgtcg | 1320 |
| acgggtgatca | tcactcttcgg | cgtgtcgcgtg | gcggccatgc | tgctggcgcg | gttggtcgtc | 1380 |
| cgtccgatcc | ggcgggttgca | ggccggcgccc | cagcagatca | gcggcggtga | ctaccgcctc | 1440 |
| gctctgcccgg | tggtgtctcgt | tgacgaattc | ggcgatctga | caacagcttt | caacgacatg | 1500 |
| agtcgcaatc | tgctgatcaa | ggacgagctg | ctcggcgagg | agcgcgccga | gaaccaacgg | 1560 |
| ctgatgctgt | ccctgatgcc | cgaaccggtg | atgcagcgct | acctcgacgg | ggaggagacg | 1620 |
| atcgcccagg | accacaagaa | cgtcacgggtg | atcttcgcgc | acatgatggg | cctcgacgag | 1680 |
| ttgtcgcgca | tggtgacctc | cgagggaactg | atgggtgggtg | tcaacgacct | gacccgccag | 1740 |
| ttcgacgcgc | ccgcgagag | tctcgggggtc | gaccacgtgc | ggacgctgca | cgacgggtac | 1800 |
| ctggccagct | gcggggttagg | cgtgccgcgcg | ctggacaacg | tccggcgcac | ggtcaatttc | 1860 |
| gcgatcgaaa | tggaccgcat | catcgaccgg | cacgcgcgcg | agtccgggca | cgacctgcgc | 1920 |
| ctccgcgcgcg | gcacgcgac | cgggtcgcgcg | gccagcgggc | tggtggggcg | gtccacgttg | 1980 |
| gcgtacgaca | tgtgggggttc | ggcggtcgat | gtcgctaacc | aggtgcagcg | cggctcccc | 2040 |
| cagcccggca | tctacgtcac | ctcgcgggtg | cacgaggtca | tgcaggaaac | tctcgacttc | 2100 |
| gtcgcgcgcg | gggaggtcgt | cggcgagcgc | ggcgctcgaga | cggctctggcg | ggtgcagggc | 2160 |
| caccggcgat | ga | | | | | 2172 |

<210> 174
 <211> 722
 <212> PRT
 <213> Mycobacterium vaccae

<400> 174

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Thr | Ile | Leu | Pro | Trp | Asn | Ala | Arg | Thr | Ser | Glu | His | Pro | Thr | Arg |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Lys | Arg | Arg | Gly | Arg | Tyr | His | Leu | Leu | Ser | Arg | Met | Ser | Ile | Gln | Ser |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Lys | Leu | Leu | Leu | Met | Leu | Leu | Leu | Thr | Ser | Ile | Leu | Ser | Ala | Ala | Val |
| | 35 | | | | | | 40 | | | | | | 45 | | |

| | | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Val | Gly | Phe | Ile | Gly | Tyr | Gln | Ser | Gly | Arg | Ser | Ser | Leu | Arg | Ala | Ser | 50 | 55 | 60 |
| Val | Phe | Asp | Arg | Leu | Thr | Asp | Ile | Arg | Glu | Ser | Gln | Ser | Arg | Gly | Leu | 65 | 70 | 75 |
| Glu | Asn | Gln | Phe | Ala | Asp | Leu | Lys | Asn | Ser | Met | Val | Ile | Tyr | Ser | Arg | 85 | 90 | 95 |
| Gly | Ser | Thr | Ala | Thr | Glu | Ala | Ile | Gly | Ala | Phe | Ser | Asp | Gly | Phe | Arg | 100 | 105 | 110 |
| Gln | Leu | Gly | Asp | Ala | Thr | Ile | Asn | Thr | Gly | Gln | Ala | Ala | Ser | Leu | Arg | 115 | 120 | 125 |
| Arg | Tyr | Tyr | Asp | Arg | Thr | Phe | Ala | Asn | Thr | Thr | Leu | Asp | Asp | Ser | Gly | 130 | 135 | 140 |
| Asn | Arg | Val | Asp | Val | Arg | Ala | Leu | Ile | Pro | Lys | Ser | Asn | Pro | Gln | Arg | 145 | 150 | 155 |
| Tyr | Leu | Gln | Ala | Leu | Tyr | Thr | Pro | Pro | Phe | Gln | Asn | Trp | Glu | Lys | Ala | 165 | 170 | 175 |
| Ile | Ala | Phe | Asp | Asp | Ala | Arg | Asp | Gly | Ser | Ala | Trp | Ser | Ala | Ala | Asn | 180 | 185 | 190 |
| Ala | Arg | Phe | Asn | Glu | Phe | Phe | Arg | Glu | Ile | Val | His | Arg | Phe | Asn | Phe | 195 | 200 | 205 |
| Glu | Asp | Leu | Met | Leu | Leu | Asp | Leu | Glu | Gly | Asn | Val | Val | Tyr | Ser | Ala | 210 | 215 | 220 |
| Tyr | Lys | Gly | Pro | Asp | Leu | Gly | Thr | Asn | Ile | Val | Asn | Gly | Pro | Tyr | Arg | 225 | 230 | 235 |
| Asn | Arg | Glu | Leu | Ser | Glu | Ala | Tyr | Glu | Lys | Ala | Val | Ala | Ser | Asn | Ser | 245 | 250 | 255 |
| Ile | Asp | Tyr | Val | Gly | Val | Thr | Asp | Phe | Gly | Trp | Tyr | Leu | Pro | Ala | Glu | 260 | 265 | 270 |
| Glu | Pro | Thr | Ala | Trp | Phe | Leu | Ser | Pro | Val | Gly | Leu | Lys | Asp | Arg | Val | 275 | 280 | 285 |
| Asp | Gly | Val | Met | Ala | Val | Gln | Phe | Pro | Ile | Ala | Arg | Ile | Asn | Glu | Leu | 290 | 295 | 300 |
| Met | Thr | Ala | Arg | Gly | Gln | Trp | Arg | Asp | Thr | Gly | Met | Gly | Asp | Thr | Gly | 305 | 310 | 315 |
| Glu | Thr | Ile | Leu | Val | Gly | Pro | Asp | Asn | Leu | Met | Arg | Ser | Asp | Ser | Arg | 325 | 330 | 335 |
| Leu | Phe | Arg | Glu | Asn | Arg | Glu | Lys | Phe | Leu | Ala | Asp | Val | Val | Glu | Gly | 340 | 345 | 350 |
| Gly | Thr | Pro | Pro | Glu | Val | Ala | Asp | Glu | Ser | Val | Asp | Arg | Arg | Gly | Thr | 355 | 360 | 365 |
| Thr | Leu | Val | Gln | Pro | Val | Thr | Thr | Arg | Ser | Val | Glu | Glu | Ala | Gln | Arg | 370 | 375 | 380 |
| Gly | Asn | Thr | Gly | Thr | Thr | Ile | Glu | Asp | Asp | Tyr | Leu | Gly | His | Glu | Ala | 385 | 390 | 395 |
| Leu | Gln | Ala | Tyr | Ser | Pro | Val | Asp | Leu | Pro | Gly | Leu | His | Trp | Val | Ile | 405 | 410 | 415 |
| Val | Ala | Lys | Ile | Asp | Thr | Asp | Glu | Ala | Phe | Ala | Pro | Val | Ala | Gln | Phe | 420 | 425 | 430 |
| Thr | Arg | Thr | Leu | Val | Leu | Ser | Thr | Val | Ile | Ile | Ile | Phe | Gly | Val | Ser | 435 | 440 | 445 |
| Leu | Ala | Ala | Met | Leu | Leu | Ala | Arg | Leu | Phe | Val | Arg | Pro | Ile | Arg | Arg | 450 | 455 | 460 |
| Leu | Gln | Ala | Gly | Ala | Gln | Gln | Ile | Ser | Gly | Gly | Asp | Tyr | Arg | Leu | Ala | 465 | 470 | 475 |
| Leu | Pro | Val | Leu | Ser | Arg | Asp | Glu | Phe | Gly | Asp | Leu | Thr | Thr | Ala | Phe | 485 | 490 | 495 |
| Asn | Asp | Met | Ser | Arg | Asn | Leu | Ser | Ile | Lys | Asp | Glu | Leu | Leu | Gly | Glu | | | |

<400> 176

| | | | | | | |
|-------------|-------------|-------------|------------|-------------|-------------|------|
| ggctatcagt | ccggacggtc | ctcgtgctgc | gcacgcggtg | tcgaccgcct | caccgacatc | 60 |
| cgcgagtcgc | agtcgcgcgg | gttgagagaat | cagttcgcgg | acctgaagaa | ctcgatgggtg | 120 |
| atttactcgc | gcggcagcac | tgccacggag | gcgatcggcg | cgttcagcga | cggtttccgt | 180 |
| cagctcggcg | atgcgacgat | caataccggg | caggcggcgt | cattgcgccg | ttactacgac | 240 |
| cggacgttcg | ccaacaccac | cctcgacgac | agcggaaacc | gcgtcgacgt | ccgcgcgctc | 300 |
| atccccgaaat | ccaacccccca | gcgctatctg | caggcgtctt | ataccccgcc | gtttcagaac | 360 |
| tgggagaagg | cgatcgcggt | cgacgacgcg | cgcgacggca | gcgcctgggtc | ggccgccaat | 420 |
| gccagattca | acgagttctt | ccgcgagatc | gtgcaccgct | tcaacttcga | ggatctgatg | 480 |
| ctgctcgacc | tcgagggcaa | cgtgggtgtac | tccgcctaca | agggggccgga | tctcgggaca | 540 |
| aacatcgta | acggccccta | tcgcaaccgg | gaactgtcgg | aagcctacga | gaaggcggtc | 600 |
| gcgtcgaaat | cgatcgacta | tgtcgggtgtc | accgacttcg | ggtgggtacct | gcctgccgag | 660 |
| gaaccgaccg | cctgggttct | gtccccggtc | gggttgaaag | accgagtcga | cgggtgtgatg | 720 |
| gcggtccagt | tcccgatcgc | gcggatcaac | gaattgatga | cggcgcgggg | acagtggcgt | 780 |
| gacaccggga | tgggagacac | cggtgagacc | atcctgggtc | gaccggacaa | tctgatgcgc | 840 |
| tcggactccc | ggctgttccg | cgagaaccgg | gagaagttcc | tggccgacgt | cgtcgagggg | 900 |
| ggaacccgcg | cggaggtcgc | cgacgaatcg | gttgaccgoc | gcggcaccac | gctggtgcag | 960 |
| ccggtgacca | cccgtctcgt | cgaggaggcc | caacgcggca | acaccgggac | gacgatcgag | 1020 |
| gacgactatc | tcggccacga | ggcggttacg | gcgtactcac | cgggtggacct | gccgggactg | 1080 |
| cactgggtga | tcgtggccaa | gatcgacacc | gacgaggcgt | tcgccccggt | ggcgagttc | 1140 |
| accaggacc | tgggtgctgtc | gacggtgatc | atcatcttcg | gcgtgtcgct | ggcgcccatg | 1200 |
| ctgctggcgc | ggttgttctg | ccgtccgac | cggcggttgc | aggccggcgc | ccagcagatc | 1260 |
| agcggcggtg | actaccgcct | cgctctgccg | gtgttgcttc | gtgacgaatt | cggcgatctg | 1320 |
| acaacagctt | tcaacgacat | gagtcgcaat | ctgtcgatca | aggacgagct | gctcggcgag | 1380 |
| gagcgcgccg | agaaccaacg | gctgatgctg | tcctgatgc | ccgaaccggt | gatgcagcgc | 1440 |
| tacctcgacg | gggaggagac | gatcgcccag | gaccacaaga | acgtcacggt | gatcttcgcc | 1500 |
| gacatgatgg | gcctcgacga | gttgctcgcg | atgttgacct | ccgaggaact | gatggtgggtg | 1560 |
| gtcaacgacc | tgaccgcgca | gttcgacgcc | gccgccgaga | gtctcggggg | cgaccacgtg | 1620 |
| cggacgctgc | acgacgggta | cctggccagc | tgcgggttag | gcgtgcccg | gctggacaac | 1680 |
| gtccggcgca | cgggtcaattt | cgcgatcgaa | atggaccgca | tcacgaccg | gcacgccgcc | 1740 |
| gagtcggggc | acgacctgcg | gctccgcgcg | ggcatcgaca | ccgggtcggc | ggccagcggg | 1800 |
| ctgggtggggc | gggtccacgtt | ggcgtacgac | atgtgggggt | cggcggtcga | tgtcgctaac | 1860 |
| cagggtgcagc | gcggctcccc | ccagcccggc | atctacgtca | cctcgcggtg | gcacgaggtc | 1920 |
| atgcaggaaa | ctctcgactt | cgtcgccgcc | ggggaggtcg | tcggcgagcg | cggcgctcgag | 1980 |
| acgggtctggc | ggttgcaggg | ccaccggcga | tga | | | 2013 |

<210> 177

<211> 297

<212> PRT

<213> Mycobacterium vaccae

<220>

<221> UNSURE

<222> (145)...(145)

<221> UNSURE

<222> (151)...(151)

<400> 177

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Glu | Gln | Pro | Phe | Arg | Leu | Gly | Asp | Trp | Ile | Thr | Val | Pro | Thr | Ala | Ala |
| 1 | | | 5 | | | | | 10 | | | | | | 15 | |
| Gly | Arg | Pro | Ser | Ala | His | Gly | Arg | Val | Val | Glu | Val | Asn | Trp | Arg | Ala |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Thr | His | Ile | Asp | Thr | Gly | Gly | Asn | Leu | Leu | Val | Met | Pro | Asn | Ala | Glu |
| | | 35 | | | | | 40 | | | | | | 45 | | |
| Leu | Ala | Gly | Ala | Ser | Phe | Thr | Asn | Tyr | Ser | Arg | Pro | Val | Gly | Glu | His |
| | 50 | | | | | 55 | | | | | 60 | | | | |

Arg Leu Thr Val Val Thr Thr Phe Asn Ala Ala Asp Thr Pro Asp Asp
65 70 75 80
Val Cys Glu Met Leu Ser Ser Val Ala Ala Ser Leu Pro Glu Leu Arg
85 90 95
Thr Asp Gly Gln Ile Ala Thr Leu Tyr Leu Gly Ala Ala Glu Tyr Glu
100 105 110
Lys Ser Ile Pro Leu His Thr Pro Ala Val Asp Asp Ser Val Arg Ser
115 120 125
Thr Tyr Leu Arg Trp Val Trp Tyr Ala Ala Arg Arg Gln Glu Leu Arg
130 135 140
Xaa Asn Gly Val Ala Asp Xaa Phe Asp Thr Pro Glu Arg Ile Ala Ser
145 150 155 160
Ala Met Arg Ala Val Ala Ser Thr Leu Arg Leu Ala Asp Asp Glu Gln
165 170 175
Gln Glu Ile Ala Asp Val Val Arg Leu Val Arg Tyr Gly Asn Gly Glu
180 185 190
Arg Leu Gln Gln Pro Gly Gln Val Pro Thr Gly Met Arg Phe Ile Val
195 200 205
Asp Gly Arg Val Ser Leu Ser Val Ile Asp Gln Asp Gly Asp Val Ile
210 215 220
Pro Ala Arg Val Leu Glu Arg Gly Asp Phe Leu Gly Gln Thr Thr Leu
225 230 235 240
Thr Arg Glu Pro Val Leu Ala Thr Ala His Ala Leu Glu Glu Val Thr
245 250 255
Val Leu Glu Met Ala Arg Asp Glu Ile Glu Arg Leu Val His Arg Lys
260 265 270
Pro Ile Leu Leu His Val Ile Gly Ala Val Ala Asp Arg Arg Ala His
275 280 285
Glu Leu Arg Leu Met Asp Ser Gln Asp
290 295

<210> 178

<211> 670

<212> PRT

<213> Mycobacterium vaccae

<400> 178

Gly Tyr Gln Ser Gly Arg Ser Ser Leu Arg Ala Ser Val Phe Asp Arg
1 5 10 15
Leu Thr Asp Ile Arg Glu Ser Gln Ser Arg Gly Leu Glu Asn Gln Phe
20 25 30
Ala Asp Leu Lys Asn Ser Met Val Ile Tyr Ser Arg Gly Ser Thr Ala
35 40 45
Thr Glu Ala Ile Gly Ala Phe Ser Asp Gly Phe Arg Gln Leu Gly Asp
50 55 60
Ala Thr Ile Asn Thr Gly Gln Ala Ala Ser Leu Arg Arg Tyr Tyr Asp
65 70 75 80
Arg Thr Phe Ala Asn Thr Thr Leu Asp Asp Ser Gly Asn Arg Val Asp
85 90 95
Val Arg Ala Leu Ile Pro Lys Ser Asn Pro Gln Arg Tyr Leu Gln Ala
100 105 110
Leu Tyr Thr Pro Pro Phe Gln Asn Trp Glu Lys Ala Ile Ala Phe Asp
115 120 125
Asp Ala Arg Asp Gly Ser Ala Trp Ser Ala Ala Asn Ala Arg Phe Asn
130 135 140
Glu Phe Phe Arg Glu Ile Val His Arg Phe Asn Phe Glu Asp Leu Met
145 150 155 160

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Leu | Leu | Asp | Leu | Glu | Gly | Asn | Val | Val | Tyr | Ser | Ala | Tyr | Lys | Gly | Pro |
| | | | | 165 | | | | | 170 | | | | | 175 | |
| Asp | Leu | Gly | Thr | Asn | Ile | Val | Asn | Gly | Pro | Tyr | Arg | Asn | Arg | Glu | Leu |
| | | | 180 | | | | | 185 | | | | | 190 | | |
| Ser | Glu | Ala | Tyr | Glu | Lys | Ala | Val | Ala | Ser | Asn | Ser | Ile | Asp | Tyr | Val |
| | | 195 | | | | | 200 | | | | | 205 | | | |
| Gly | Val | Thr | Asp | Phe | Gly | Trp | Tyr | Leu | Pro | Ala | Glu | Glu | Pro | Thr | Ala |
| | 210 | | | | | 215 | | | | 220 | | | | | |
| Trp | Phe | Leu | Ser | Pro | Val | Gly | Leu | Lys | Asp | Arg | Val | Asp | Gly | Val | Met |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 |
| Ala | Val | Gln | Phe | Pro | Ile | Ala | Arg | Ile | Asn | Glu | Leu | Met | Thr | Ala | Arg |
| | | | | 245 | | | | | 250 | | | | | 255 | |
| Gly | Gln | Trp | Arg | Asp | Thr | Gly | Met | Gly | Asp | Thr | Gly | Glu | Thr | Ile | Leu |
| | | | 260 | | | | | 265 | | | | | 270 | | |
| Val | Gly | Pro | Asp | Asn | Leu | Met | Arg | Ser | Asp | Ser | Arg | Leu | Phe | Arg | Glu |
| | | 275 | | | | | 280 | | | | | 285 | | | |
| Asn | Arg | Glu | Lys | Phe | Leu | Ala | Asp | Val | Val | Glu | Gly | Gly | Thr | Pro | Pro |
| | 290 | | | | | 295 | | | | | 300 | | | | |
| Glu | Val | Ala | Asp | Glu | Ser | Val | Asp | Arg | Arg | Gly | Thr | Thr | Leu | Val | Gln |
| 305 | | | | | 310 | | | | | 315 | | | | | 320 |
| Pro | Val | Thr | Thr | Arg | Ser | Val | Glu | Glu | Ala | Gln | Arg | Gly | Asn | Thr | Gly |
| | | | | 325 | | | | | 330 | | | | | 335 | |
| Thr | Thr | Ile | Glu | Asp | Asp | Tyr | Leu | Gly | His | Glu | Ala | Leu | Gln | Ala | Tyr |
| | | | 340 | | | | | 345 | | | | | 350 | | |
| Ser | Pro | Val | Asp | Leu | Pro | Gly | Leu | His | Trp | Val | Ile | Val | Ala | Lys | Ile |
| | | 355 | | | | | 360 | | | | | 365 | | | |
| Asp | Thr | Asp | Glu | Ala | Phe | Ala | Pro | Val | Ala | Gln | Phe | Thr | Arg | Thr | Leu |
| | 370 | | | | | 375 | | | | | 380 | | | | |
| Val | Leu | Ser | Thr | Val | Ile | Ile | Ile | Phe | Gly | Val | Ser | Leu | Ala | Ala | Met |
| 385 | | | | | 390 | | | | | 395 | | | | | 400 |
| Leu | Leu | Ala | Arg | Leu | Phe | Val | Arg | Pro | Ile | Arg | Arg | Leu | Gln | Ala | Gly |
| | | | | 405 | | | | | 410 | | | | | 415 | |
| Ala | Gln | Gln | Ile | Ser | Gly | Gly | Asp | Tyr | Arg | Leu | Ala | Leu | Pro | Val | Leu |
| | | | 420 | | | | | 425 | | | | | 430 | | |
| Ser | Arg | Asp | Glu | Phe | Gly | Asp | Leu | Thr | Thr | Ala | Phe | Asn | Asp | Met | Ser |
| | | 435 | | | | | 440 | | | | | 445 | | | |
| Arg | Asn | Leu | Ser | Ile | Lys | Asp | Glu | Leu | Leu | Gly | Glu | Glu | Arg | Ala | Glu |
| | | 450 | | | | 455 | | | | | 460 | | | | |
| Asn | Gln | Arg | Leu | Met | Leu | Ser | Leu | Met | Pro | Glu | Pro | Val | Met | Gln | Arg |
| 465 | | | | | 470 | | | | | 475 | | | | | 480 |
| Tyr | Leu | Asp | Gly | Glu | Glu | Thr | Ile | Ala | Gln | Asp | His | Lys | Asn | Val | Thr |
| | | | 485 | | | | | | 490 | | | | | 495 | |
| Val | Ile | Phe | Ala | Asp | Met | Met | Gly | Leu | Asp | Glu | Leu | Ser | Arg | Met | Leu |
| | | | 500 | | | | | 505 | | | | | 510 | | |
| Thr | | | | | | | | | | | | | | | |

610 615 620
 Gly Ser Pro Gln Pro Gly Ile Tyr Val Thr Ser Arg Val His Glu Val
 625 630 635 640
 Met Gln Glu Thr Leu Asp Phe Val Ala Ala Gly Glu Val Val Gly Glu
 645 650 655
 Arg Gly Val Glu Thr Val Trp Arg Leu Gln Gly His Arg Arg
 660 665 670

<210> 179
 <211> 520
 <212> DNA
 <213> Mycobacterium vaccae

<400> 179
 gtgatcgacg aaaccctctt ccatgccgag gagaagatgg agaaggccgt ctcggtggca 60
 cccgacgacc tggcgctgat tcgtaccggc cgcgcgaacc ccggcatgtt caaccggatc 120
 aacatcgact actacggcgc ctccaccccg atcacgcagc tgtccagcat caacgtgccc 180
 gaggcgcgca tgggtggtgat caagccctac gaggcgagcc agctgcgcct catcgaggat 240
 gcgatccgca actccgacct cggcgctcaat ccgaccaacg acggcaacat catccgggtg 300
 tcgatcccg cagtcaccca ggagcgccgc cgcgacctgg tcaagcaggc caaggccaag 360
 ggcgaggacg ccaaggtgtc ggtgcgcgaac atccgtcgca acgatatgaa cacctttcgc 420
 atcgaccggg tacggctgcc gacgccaccg ccgtcgtaga agcgacagag gatcgaggtg 480
 aacggtattg gccacgcctt ctgtggcggg ccgacaccac 520

<210> 180
 <211> 1071
 <212> DNA
 <213> Mycobacterium vaccae

<400> 180
 cgtggggaag gattgcactc tatgagcgaa atcgcccgtc cctggcgggt tctggcaggt 60
 ggcacgcggt cctgcgcgcg gggatccgcc ggggtgctga gcacgcggt caccacggcg 120
 tcggcccagc cgggcccctcc gcagcccccg ctgcccgcgc ctgccacagt gacgcaaacc 180
 gtcacgggtt cgcccaacgc cgcgccacaa ctcatccgcg gcccgggtgt gacgcctgcc 240
 accggcgggc ccgcgcgggt gccgcgggg gtgagcgccc cggcggtcgc gccggccccc 300
 gcgctgcccg cccgcggggt gtccacgata gcccgggcca cctcgggcac gctcagcgag 360
 ttcttcgccc ccaagggcgt cacgatggag ccgcagtgca gccgcgactt ccgcgccttc 420
 aacatcgtgc tgccgaagcc gcggggctgg gagcacatcc cggaccgaa cgtgccggac 480
 gcgttcgccc tgctggccga ccgggtcggc ggcaacggcc tgtactcgtc gaacgccag 540
 gtggtggtct acaaactcgt cggcgagttc gaccccaagg aagcgatcag ccacggcttc 600
 gtcgacagcc agaagctgcc ggcgtggcgt tccaccgacg cgtcgctggc cgacttcggc 660
 ggaatgccgt cctcgctgat cgagggcacc taccgcgaga acaacatgaa gctgaacacg 720
 tcccggcgcc acgtcattgc caccgcgggg cccgaccact acctggtgtc gctgtcgggtg 780
 accaccagcg tcgaacaggc cgtggccgaa gccgcggagg ccaccgacgc gattgtcaac 840
 ggcttcaagg tcagcgttcc ggggtccgggt ccggccgcac cgccacctgc acccggtgcc 900
 cccggtgtcc cggccgcccc cggcgccccg gcgctgcccg tggccgtcgc accacccccg 960
 gctcccgtg ttcccgcgtt ggcgccccgc ccacagctgc tgggactgca gggatagacg 1020
 tcgtcgtccc ccgggcgaag cctggcgccc gggggacgac ggcccccttc t 1071

<210> 181
 <211> 152
 <212> PRT
 <213> Mycobacterium vaccae

<400> 181
 Val Ile Asp Glu Thr Leu Phe His Ala Glu Glu Lys Met Glu Lys Ala
 1 5 10 15

Val Ser Val Ala Pro Asp Asp Leu Ala Ser Ile Arg Thr Gly Arg Ala
 20 25 30
 Asn Pro Gly Met Phe Asn Arg Ile Asn Ile Asp Tyr Tyr Gly Ala Ser
 35 40 45
 Thr Pro Ile Thr Gln Leu Ser Ser Ile Asn Val Pro Glu Ala Arg Met
 50 55 60
 Val Val Ile Lys Pro Tyr Glu Ala Ser Gln Leu Arg Leu Ile Glu Asp
 65 70 75 80
 Ala Ile Arg Asn Ser Asp Leu Gly Val Asn Pro Thr Asn Asp Gly Asn
 85 90 95
 Ile Ile Arg Val Ser Ile Pro Gln Leu Thr Glu Glu Arg Arg Arg Asp
 100 105 110
 Leu Val Lys Gln Ala Lys Ala Lys Gly Glu Asp Ala Lys Val Ser Val
 115 120 125
 Arg Asn Ile Arg Arg Asn Asp Met Asn Thr Phe Arg Ile Ala Pro Val
 130 135 140
 Arg Leu Pro Thr Pro Pro Ser
 145 150

<210> 182
 <211> 331
 <212> PRT
 <213> Mycobacterium vaccae

<400> 182
 Met Ser Glu Ile Ala Arg Pro Trp Arg Val Leu Ala Gly Gly Ile Gly
 1 5 10 15
 Ala Cys Ala Ala Gly Ile Ala Gly Val Leu Ser Ile Ala Val Thr Thr
 20 25 30
 Ala Ser Ala Gln Pro Gly Leu Pro Gln Pro Pro Leu Pro Ala Pro Ala
 35 40 45
 Thr Val Thr Gln Thr Val Thr Val Ala Pro Asn Ala Ala Pro Gln Leu
 50 55 60
 Ile Pro Arg Pro Gly Val Thr Pro Ala Thr Gly Gly Ala Ala Ala Val
 65 70 75 80
 Pro Ala Gly Val Ser Ala Pro Ala Val Ala Pro Ala Pro Ala Leu Pro
 85 90 95
 Ala Arg Pro Val Ser Thr Ile Ala Pro Ala Thr Ser Gly Thr Leu Ser
 100 105 110
 Glu Phe Phe Ala Ala Lys Gly Val Thr Met Glu Pro Gln Ser Ser Arg
 115 120 125
 Asp Phe Arg Ala Leu Asn Ile Val Leu Pro Lys Pro Arg Gly Trp Glu
 130 135 140
 His Ile Pro Asp Pro Asn Val Pro Asp Ala Phe Ala Val Leu Ala Asp
 145 150 155 160
 Arg Val Gly Gly Asn Gly Leu Tyr Ser Ser Asn Ala Gln Val Val Val
 165 170 175
 Tyr Lys Leu Val Gly Glu Phe Asp Pro Lys Glu Ala Ile Ser His Gly
 180 185 190
 Phe Val Asp Ser Gln Lys Leu Pro Ala Trp Arg Ser Thr Asp Ala Ser
 195 200 205
 Leu Ala Asp Phe Gly Gly Met Pro Ser Ser Leu Ile Glu Gly Thr Tyr
 210 215 220
 Arg Glu Asn Asn Met Lys Leu Asn Thr Ser Arg Arg His Val Ile Ala
 225 230 235 240
 Thr Ala Gly Pro Asp His Tyr Leu Val Ser Leu Ser Val Thr Thr Ser
 245 250 255

Val Glu Gln Ala Val Ala Glu Ala Ala Glu Ala Thr Asp Ala Ile Val
 260 265 270
 Asn Gly Phe Lys Val Ser Val Pro Gly Pro Gly Pro Ala Ala Pro Pro
 275 280 285
 Pro Ala Pro Gly Ala Pro Gly Val Pro Pro Ala Pro Gly Ala Pro Ala
 290 295 300
 Leu Pro Leu Ala Val Ala Pro Pro Pro Ala Pro Ala Val Pro Ala Val
 305 310 315 320
 Ala Pro Ala Pro Gln Leu Leu Gly Leu Gln Gly
 325 330

<210> 183
 <211> 207
 <212> DNA
 <213> Mycobacterium vaccae

<400> 183
 acctacgagt tgcagaacaa ggtcacgggc ggccgcaccc cgcgcgagta catcccgtcg 60
 gtggatgccg gcgcgcagga cgccatgcag tacggcgtgc tggccggcta cccgctgggt 120
 aacgtcaagc tgacgtctgt cgacgggtgcc taccacgaag tcgactcgtc ggaaatggca 180
 ttcaagggtg ccggctccca ggtcata 207

<210> 184
 <211> 69
 <212> PRT
 <213> Mycobacterium vaccae

<400> 184
 Thr Tyr Glu Phe Glu Asn Lys Val Thr Gly Gly Arg Ile Pro Arg Glu
 1 5 10 15
 Tyr Ile Pro Ser Val Asp Ala Gly Ala Gln Asp Ala Met Gln Tyr Gly
 20 25 30
 Val Leu Ala Gly Tyr Pro Leu Val Asn Val Lys Leu Thr Leu Leu Asp
 35 40 45
 Gly Ala Tyr His Glu Val Asp Ser Ser Glu Met Ala Phe Lys Val Ala
 50 55 60
 Gly Ser Gln Val Ile
 65

<210> 185
 <211> 898
 <212> DNA
 <213> Mycobacterium vaccae

<220>
 <221> unsure
 <222> (637)...(637)

<221> unsure
 <222> (662)...(662)

<400> 185
 cgacctccac ccgggcgtga ggccaaccac taggctgggtc accagtagtc gacggcacac 60
 ttcaccgaaa aaatgaggac agaggagaca cccgtgacga tccgtgttgg tgtgaacggc 120
 ttcggccgta tcggacgcaa cttcttccgc gcgctggacg cgcagaaggc cgaaggcaag 180
 aacaaggaca tcgagatcgt cgcgggtcaac gacctcaccg acaacgccac gctggcgcac 240
 ctgctgaagt tcgactcgat cctgggcccgg ctgccctacg acgtgagcct cgaaggcgag 300

| | | | | | | |
|------------|------------|------------|------------|-------------|------------|-----|
| gacaccatcg | tcgtcggcag | caccaagatc | aaggcgctcg | aggtcaagga | aggcccggcg | 360 |
| gcgctgccct | ggggcgacct | gggcgtcgac | gtcgtcgtcg | agtccaccgg | catcttcacc | 420 |
| aagcgcgaca | aggcccaggg | ccacctcgac | gcgggcgcca | agaaggatcat | catctccgcg | 480 |
| ccggccaccg | atgaggacat | caccatcgtg | ctcggcgtca | acgacgacaa | gtacgacggc | 540 |
| agccagaaca | tcatctccaa | cgcgctcgtg | accacgaact | gcctcgcccc | gctggcgaag | 600 |
| gtcatcaacg | acgagttcgg | catcgtcaag | ggcctgntga | ccaccatcca | cgcctacacc | 660 |
| cnggtccaga | acctgcagga | cgccccgcac | aaggatctgc | gccggggccc | cgccgccgcg | 720 |
| ctgaacatcg | tgccgacctc | caccggtgcc | gccaaggcca | tcggactggg | gctgcccag | 780 |
| ctgaagggca | agctcgacgg | ctacgcgctg | cgggtgccga | tccccaccgg | ctcggtcacc | 840 |
| gacctgaccg | ccgagctggg | caagtcggcc | accgtggacg | agatcaacgc | cgcgatga | 898 |

<210> 186

<211> 268

<212> PRT

<213> Mycobacterium vaccae

<220>

<221> UNSURE

<222> (182)...(182)

<221> UNSURE

<222> (190)...(190)

<400> 186

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Val | Thr | Ile | Arg | Val | Gly | Val | Asn | Gly | Phe | Gly | Arg | Ile | Gly | Arg | Asn |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Phe | Phe | Arg | Ala | Leu | Asp | Ala | Gln | Lys | Ala | Glu | Gly | Lys | Asn | Lys | Asp |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Ile | Glu | Ile | Val | Ala | Val | Asn | Asp | Leu | Thr | Asp | Asn | Ala | Thr | Leu | Ala |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| His | Leu | Leu | Lys | Phe | Asp | Ser | Ile | Leu | Gly | Arg | Leu | Pro | Tyr | Asp | Val |
| | 50 | | | | | 55 | | | | 60 | | | | | |
| Ser | Leu | Glu | Gly | Glu | Asp | Thr | Ile | Val | Val | Gly | Ser | Thr | Lys | Ile | Lys |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Ala | Leu | Glu | Val | Lys | Glu | Gly | Pro | Ala | Ala | Leu | Pro | Trp | Gly | Asp | Leu |
| | | | | 85 | | | | | 90 | | | | 95 | | |
| Gly | Val | Asp | Val | Val | Val | Glu | Ser | Thr | Gly | Ile | Phe | Thr | Lys | Arg | Asp |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Lys | Ala | Gln | Gly | His | Leu | Asp | Ala | Gly | Ala | Lys | Lys | Val | Ile | Ile | Ser |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Ala | Pro | Ala | Thr | Asp | Glu | Asp | Ile | Thr | Ile | Val | Leu | Gly | Val | Asn | Asp |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Asp | Lys | Tyr | Asp | Gly | Ser | Gln | Asn | Ile | Ile | Ser | Asn | Ala | Ser | Cys | Thr |
| 145 | | | | | 150 | | | | | 155 | | | | 160 | |
| Thr | Asn | Cys | Leu | Gly | Pro | Leu | Ala | Lys | Val | Ile | Asn | Asp | Glu | Phe | Gly |
| | | | 165 | | | | | | 170 | | | | | 175 | |
| Ile | Val | Lys | Gly | Leu | Xaa | Thr | Thr | Ile | His | Ala | Tyr | Thr | Xaa | Val | Gln |
| | | 180 | | | | | | 185 | | | | | 190 | | |
| Asn | Leu | Gln | Asp | Gly | Pro | His | Lys | Asp | Leu | Arg | Arg | Ala | Arg | Ala | Ala |
| | 195 | | | | | | 200 | | | | | 205 | | | |
| Ala | Leu | Asn | Ile | Val | Pro | Thr | Ser | Thr | Gly | Ala | Ala | Lys | Ala | Ile | Gly |
| | 210 | | | | | 215 | | | | | 220 | | | | |
| Leu | Val | Leu | Pro | Glu | Leu | Lys | Gly | Lys | Leu | Asp | Gly | Tyr | Ala | Leu | Arg |
| 225 | | | | | 230 | | | | | 235 | | | | 240 | |
| Val | Pro | Ile | Pro | Thr | Gly | Ser | Val | Thr | Asp | Leu | Thr | Ala | Glu | Leu | Gly |
| | | | 245 | | | | | | 250 | | | | | 255 | |
| Lys | Ser | Ala | Thr | Val | Asp | Glu | Ile | Asn | Ala | Ala | Met | | | | |

260

265

<210> 187
<211> 41
<212> PRT
<213> Mycobacterium vaccae

<220>
<221> UNSURE
<222> (39)...(39)

<400> 187

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Asn | Lys | Ala | Glu | Leu | Ile | Asp | Val | Leu | Thr | Glu | Lys | Leu | Gly | Ser |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Asp | Arg | Arg | Gln | Ala | Thr | Ala | Ala | Val | Glu | Asn | Val | Val | Asp | Thr | Ile |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Val | Ala | Ala | Val | Pro | Lys | Xaa | Val | Val | | | | | | | |
| | | | 35 | | | | | 40 | | | | | | | |

<210> 188
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> Made in a lab

<221> unsure
<222> (12)...(12)

<400> 188

atgaayaarg cngarctsat ygaygt

26

<210> 189
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Made in a lab

<400> 189

atsgtrtgva cvacgttytc

20

<210> 190
<211> 84
<212> DNA
<213> Artificial Sequence

<220>
<223> Made in a lab

<221> unsure
<222> (2)...(2)

<400> 190

gnactcattg acgtactcac tgagaagctg ggctcggatt gtcggcaagc gactgcggca

60

atggagaacg tgggccacac cata

84

<210> 191
<211> 337
<212> DNA
<213> Mycobacterium vaccae

<220>
<221> unsure
<222> (2)...(2)

<400> 191
gnactcattg acgtactcac tgagaagctg ggctcggatt gtcggcaagc gactgcggcg 60
gtggagaatg ttgtcgacac catcgtgcgc gccgtgcaca aggggtgagag cgtcaccatc 120
accggccttcg gtgttttcga gcagcgtcgt cgcgcagcac gcgtggcacg caatccgcgc 180
accggcgaga ccgtgaaggt caagcccacc tcagtcccgg cattccgtcc cggcgctcag 240
ttcaaggctg ttgtctctgg cgcacagaag cttccggccg aggggtccggc ggtcaagcgc 300
gggtgtgaccg cgacgagcac cgcccgaag gcagcca 337

<210> 192
<211> 111
<212> PRT
<213> Mycobacterium vaccae

<220>
<221> UNSURE
<222> (1)...(1)

<400> 192
Xaa Leu Ile Asp Val Leu Thr Glu Lys Leu Gly Ser Asp Arg Gln Ala
1 5 10 15
Thr Ala Ala Val Glu Asn Val Val Asp Thr Ile Val Arg Ala Val His
20 25 30
Lys Gly Glu Ser Val Thr Ile Thr Gly Phe Gly Val Phe Glu Gln Arg
35 40 45
Arg Arg Ala Ala Arg Val Ala Arg Asn Pro Arg Thr Gly Glu Thr Val
50 55 60
Lys Val Lys Pro Thr Ser Val Pro Ala Phe Arg Pro Gly Ala Gln Phe
65 70 75 80
Lys Ala Val Val Ser Gly Ala Gln Lys Leu Pro Ala Glu Gly Pro Ala
85 90 95
Val Lys Arg Gly Val Thr Ala Thr Ser Thr Ala Arg Lys Ala Ala
100 105 110

<210> 193
<211> 1164
<212> DNA
<213> Mycobacterium vaccae

<400> 193
ggtggcgcg atcgagaagc gcccgccccg gttcacgggc gcctgatcat ggtgcgggcg 60
gcgtgcgct acggcttcgg gacggcctca ctgctggccg gcgggttcgt gctgcgcgcc 120
ctgcagggca cgctgcgc cctcggcgcg actccgggag aggtcgcgcc ggtggcgcg 180
cgctgcgcga actaccgca cggcaagttc gtcaacctgg agccccgctc gggcatcacg 240
atggatcgcg acctgcagcg gatgctgttg cgcgatctgg ccaacgccgc atcccaggcg 300
aagccgcccg gaccgatccc gctggccgag ccgcgaagg gggatccac tcccgcgcg 360
gcggcgggca gctggtacgg ccattccagc gtgctgatcg aggtcgacgg ctaccgcgtg 420

```

ctggccgacc cggtgtggag caacagatgt tcgcoctcac gggcggtcgg accgcagcgc 480
atgcacgacg tcccgggtgcc gctggaggcg cttcccgcgc tggacgcggt ggtgatcagc 540
cacgaccact acgaccacct cgacatcgac accatcgctc cgttggcgca caccagcgcg 600
gcccgcgttc tgggtgccgtt gggcatcggc gcacacctgc gcaagtgggg cgtccccgag 660
gcgcggatcg tcgagtttga ctggcacgaa gcccaccgca tagacgacct gacgctggtc 720
tgcacccccg ccgggcactt ctccggacgg ttgtttctcc gcgactcgac gctgtgggcg 780
tcgtgggtgg tcaccggctc gtcgcacaag gcgtttcttc gtggcgacac cggatacacg 840
aagagcttcg ccgagatcgg cgacgagtac ggtccggttc atctgaccct gctgccgac 900
ggggcctacc atcccgcgtt cgccgacatc cacatgaacc ccgaggaggg ggtgcgcgcc 960
catctggacc tgaccgaggt ggacaacagc ctgatgggtg ccatccactg ggcgacattc 1020
cgctcgccc cgcatccgtg gtccgagccc gccgaacgcc tgctgaccgc tgccgacgcc 1080
gagcgggtac gcctgaccgt gccgattccc ggtcagcggg tggaccggga gtcgacgttc 1140
gaccctgggt ggcggttctg aacc 1164

```

<210> 194
 <211> 370
 <212> PRT
 <213> Mycobacterium vaccae

```

<400> 194
Met Val Arg Ala Ala Leu Arg Tyr Gly Phe Gly Thr Ala Ser Leu Leu
1          5          10          15
Ala Gly Gly Phe Val Leu Arg Ala Leu Gln Gly Thr Pro Ala Ala Leu
20          25          30
Gly Ala Thr Pro Gly Glu Val Ala Pro Val Ala Arg Arg Ser Pro Asn
35          40          45
Tyr Arg Asp Gly Lys Phe Val Asn Leu Glu Pro Pro Ser Gly Ile Thr
50          55          60
Met Asp Arg Asp Leu Gln Arg Met Leu Leu Arg Asp Leu Ala Asn Ala
65          70          75          80
Ala Ser Gln Gly Lys Pro Pro Gly Pro Ile Pro Leu Ala Glu Pro Pro
85          90          95
Lys Gly Asp Pro Thr Pro Ala Pro Ala Ala Ala Ser Trp Tyr Gly His
100         105         110
Ser Ser Val Leu Ile Glu Val Asp Gly Tyr Arg Val Leu Ala Asp Pro
115         120         125
Val Trp Ser Asn Arg Cys Ser Pro Ser Arg Ala Val Gly Pro Gln Arg
130         135         140
Met His Asp Val Pro Val Pro Leu Glu Ala Leu Pro Ala Val Asp Ala
145         150         155         160
Val Val Ile Ser His Asp His Tyr Asp His Leu Asp Ile Asp Thr Ile
165         170         175
Val Ala Leu Ala His Thr Gln Arg Ala Pro Phe Val Val Pro Leu Gly
180         185         190
Ile Gly Ala His Leu Arg Lys Trp Gly Val Pro Glu Ala Arg Ile Val
195         200         205
Glu Leu Asp Trp His Glu Ala His Arg Ile Asp Asp Leu Thr Leu Val
210         215         220
Cys Thr Pro Ala Arg His Phe Ser Gly Arg Leu Phe Ser Arg Asp Ser
225         230         235         240
Thr Leu Trp Ala Ser Trp Val Val Thr Gly Ser Ser His Lys Ala Phe
245         250         255
Phe Gly Gly Asp Thr Gly Tyr Thr Lys Ser Phe Ala Glu Ile Gly Asp
260         265         270
Glu Tyr Gly Pro Phe Asp Leu Thr Leu Leu Pro Ile Gly Ala Tyr His
275         280         285
Pro Ala Phe Ala Asp Ile His Met Asn Pro Glu Glu Ala Val Arg Ala

```

| | | |
|---|-----|-----|
| 290 | 295 | 300 |
| His Leu Asp Leu Thr Glu Val Asp Asn Ser Leu Met Val Pro Ile His | | |
| 305 | 310 | 315 |
| Trp Ala Thr Phe Arg Leu Ala Pro His Pro Trp Ser Glu Pro Ala Glu | | |
| | 325 | 330 |
| Arg Leu Leu Thr Ala Ala Asp Ala Glu Arg Val Arg Leu Thr Val Pro | | |
| | 340 | 345 |
| Ile Pro Gly Gln Arg Val Asp Pro Glu Ser Thr Phe Asp Pro Trp Trp | | |
| | 355 | 360 |
| Arg Phe | | 365 |
| 370 | | |

<210> 195
 <211> 650
 <212> DNA
 <213> Mycobacterium vaccae

| | |
|---|-----|
| <400> 195 | |
| gacacaccag caccactgtt aacctcgcta gatcagtcgg ccgaacggaa ggacagccgt | 60 |
| gaccctgaaa accctagtag ccagcatgac cgctggggca gcagcagccg caacactcgg | 120 |
| cgctgccgcc gtgggtgtga cctcgattgc cgctgggtgcg ggtgtcgccg gcgcgtcgcc | 180 |
| cgcggtgctg aacgcaccgc tgccttcgcg cctgcccc gatctgcagg gaccgctggt | 240 |
| ctccaccttg agcgcgctgt cgggccccggg ctcccttcgcc ggcgccaagg ccacctacgt | 300 |
| ccagggcggt ctgcgcccga tcgaggcccg ggtggccgac agcggataca gcaacgccgc | 360 |
| ggccaagggc tacttcccgc tgagcttcac cgctgcgcggc atcgaccaga acggtccgat | 420 |
| cgtgaccgcc aacgtcaccg cggcggcccc gacgggcgcc gtggccaccc agccgctgac | 480 |
| gttcacgcgc gggccgagcc cgaccgatg gcagctgtcc aagcagtcgc cactggccct | 540 |
| gatgtccgcg gtgggtgatc tcccgcacga ttctgggtccg cagcgccgtc acatgtgtgg | 600 |
| cggcgctcgg gctgggtggg tgcctgggcg gctgcgcgca agatgaacat | 650 |

<210> 196
 <211> 159
 <212> PRT
 <213> Mycobacterium vaccae

| | |
|---|--|
| <400> 196 | |
| Met Thr Ala Gly Ala Ala Ala Ala Ala Thr Leu Gly Ala Ala Ala Val | |
| 1 5 10 15 | |
| Gly Val Thr Ser Ile Ala Val Gly Ala Gly Val Ala Gly Ala Ser Pro | |
| 20 25 30 | |
| Ala Val Leu Asn Ala Pro Leu Leu Ser Ala Pro Ala Pro Asp Leu Gln | |
| 35 40 45 | |
| Gly Pro Leu Val Ser Thr Leu Ser Ala Leu Ser Gly Pro Gly Ser Phe | |
| 50 55 60 | |
| Ala Gly Ala Lys Ala Thr Tyr Val Gln Gly Gly Leu Gly Arg Ile Glu | |
| 65 70 75 80 | |
| Ala Arg Val Ala Asp Ser Gly Tyr Ser Asn Ala Ala Ala Lys Gly Tyr | |
| 85 90 95 | |
| Phe Pro Leu Ser Phe Thr Val Ala Gly Ile Asp Gln Asn Gly Pro Ile | |
| 100 105 110 | |
| Val Thr Ala Asn Val Thr Ala Ala Ala Pro Thr Gly Ala Val Ala Thr | |
| 115 120 125 | |
| Gln Pro Leu Thr Phe Ile Ala Gly Pro Ser Pro Thr Gly Trp Gln Leu | |
| 130 135 140 | |
| Ser Lys Gln Ser Ala Leu Ala Leu Met Ser Ala Val Ile Ala Ala | |
| 145 150 155 | |

<210> 197
 <211> 285
 <212> PRT
 <213> Mycobacterium vaccae

<400> 197

Met Gln Val Arg Arg Val Leu Gly Ser Val Gly Ala Ala Val Ala Val
 1 5 10 15
 Ser Ala Ala Leu Trp Gln Thr Gly Val Ser Ile Pro Thr Ala Ser Ala
 20 25 30
 Asp Pro Cys Pro Asp Ile Glu Val Ile Phe Ala Arg Gly Thr Gly Ala
 35 40 45
 Glu Pro Gly Leu Gly Trp Val Gly Asp Ala Phe Val Asn Ala Leu Arg
 50 55 60
 Pro Lys Val Gly Glu Gln Ser Val Gly Thr Tyr Ala Val Asn Tyr Pro
 65 70 75 80
 Ala Gly Phe Asp Phe Asp Lys Ser Ala Pro Met Gly Ala Ala Asp Ala
 85 90 95
 Ser Gly Arg Val Gln Trp Met Ala Asp Asn Cys Pro Asp Thr Lys Leu
 100 105 110
 Val Leu Gly Gly Met Ser Gln Gly Ala Gly Val Ile Asp Leu Ile Thr
 115 120 125
 Val Asp Pro Arg Pro Leu Gly Arg Phe Thr Pro Thr Pro Met Pro Pro
 130 135 140
 Arg Val Ala Asp His Val Ala Ala Val Val Val Phe Gly Asn Pro Leu
 145 150 155 160
 Arg Asp Ile Arg Gly Gly Gly Pro Leu Pro Gln Met Ser Gly Thr Tyr
 165 170 175
 Gly Pro Lys Ser Ile Asp Leu Cys Ala Leu Asp Asp Pro Phe Cys Ser
 180 185 190
 Pro Gly Phe Asn Leu Pro Ala His Phe Ala Tyr Ala Asp Asn Gly Met
 195 200 205
 Val Glu Glu Ala Ala Asn Phe Ala Arg Leu Glu Pro Gly Gln Ser Val
 210 215 220
 Glu Leu Pro Glu Ala Pro Tyr Leu His Leu Phe Val Pro Arg Gly Glu
 225 230 235 240
 Val Thr Leu Glu Asp Ala Gly Pro Leu Arg Glu Gly Asp Ala Val Arg
 245 250 255
 Phe Thr Ala Ser Gly Gly Gln Arg Val Thr Ala Thr Ala Pro Ala Glu
 260 265 270
 Ile Leu Val Trp Glu Met His Ala Gly Leu Gly Ala Ala
 275 280 285

<210> 198
 <211> 743
 <212> DNA
 <213> Mycobacterium vaccae

<400> 198

| | | | | | | |
|------------|------------|------------|------------|------------|------------|-----|
| ggatccgcgg | caccggctgg | tgacgaccaa | gtacaaccgc | gcccgcacct | ggacggccga | 60 |
| gaactccgtc | ggcatcggcg | gcgcgtacct | gtgcatctac | gggatggagg | gccccggcgg | 120 |
| ctatcagttc | gtcggccgca | ccaccaggt | gtggagtcgt | taccgccaca | cggcgccggt | 180 |
| cgaaccgcga | agtccttggc | tgctgcgggt | tttcgaccga | atttcgtggt | atccggtgtc | 240 |
| ggccgaggag | ctgctggaat | tgcgagccga | catggccgca | ggccggggct | cggtcgacat | 300 |
| caccgacggc | gtgttctccc | tcgcgagca | cgaacggttc | ctggccgaca | acgccgacga | 360 |
| catcgccgcg | ttccgttccc | ggcagggcgc | cgcgttctcc | gccgagcgga | ccgcgtgggc | 420 |
| ggccgcccgc | gagttcgacc | gcgcgagaa | agccgcgtcg | aaggccaccg | acgccgatac | 480 |

cggggacctg gtgctctacg acggtgaaga gggggtcgac gctccgttcg cgtcgagcgt 540
 gtggaaggtc gacgtcgccg tcggtgaccg ggtgggtggcc ggacagccgt tgctggcgct 600
 ggaggcgatg aagatggaga ccgtgctgcg cggcccgccg gacgggggtg tcacccagat 660
 cctgggtctcc gctgggcatc tcgtcgatcc cggcacccca ctggtcgtgg tcggcaccgg 720
 agtgcgcgca tgagcgccgt cga 743

<210> 199
 <211> 243
 <212> PRT
 <213> Mycobacterium vaccae

<400> 199
 Asp Pro Arg His Arg Leu Val Thr Thr Lys Tyr Asn Pro Ala Arg Thr
 1 5 10 15
 Trp Thr Ala Glu Asn Ser Val Gly Ile Gly Gly Ala Tyr Leu Cys Ile
 20 25 30
 Tyr Gly Met Glu Gly Pro Gly Gly Tyr Gln Phe Val Gly Arg Thr Thr
 35 40 45
 Gln Val Trp Ser Arg Tyr Arg His Thr Ala Pro Phe Glu Pro Gly Ser
 50 55 60
 Pro Trp Leu Leu Arg Phe Phe Asp Arg Ile Ser Trp Tyr Pro Val Ser
 65 70 75 80
 Ala Glu Glu Leu Leu Glu Leu Arg Ala Asp Met Ala Ala Gly Arg Gly
 85 90 95
 Ser Val Asp Ile Thr Asp Gly Val Phe Ser Leu Ala Glu His Glu Arg
 100 105 110
 Phe Leu Ala Asp Asn Ala Asp Asp Ile Ala Ala Phe Arg Ser Arg Gln
 115 120 125
 Ala Ala Ala Phe Ser Ala Glu Arg Thr Ala Trp Ala Ala Ala Gly Glu
 130 135 140
 Phe Asp Arg Ala Glu Lys Ala Ala Ser Lys Ala Thr Asp Ala Asp Thr
 145 150 155 160
 Gly Asp Leu Val Leu Tyr Asp Gly Asp Glu Arg Val Asp Ala Pro Phe
 165 170 175
 Ala Ser Ser Val Trp Lys Val Asp Val Ala Val Gly Asp Arg Val Val
 180 185 190
 Ala Gly Gln Pro Leu Leu Ala Leu Glu Ala Met Lys Met Glu Thr Val
 195 200 205
 Leu Arg Ala Pro Ala Asp Gly Val Val Thr Gln Ile Leu Val Ser Ala
 210 215 220
 Gly His Leu Val Asp Pro Gly Thr Pro Leu Val Val Val Gly Thr Gly
 225 230 235 240
 Val Arg Ala

<210> 200
 <211> 858
 <212> DNA
 <213> Mycobacterium vaccae

<400> 200
 gaaatccgc gtctgaaacc ctcttttcgc ggcgccctc aggcgggtaa gggggccaag 60
 cggattgaaa aatgttcgct gaatgagcct gaaattgcgc gtggctcttg gaaatcagca 120
 gcgatgggtt taccgtgtcc actagtcggt ccaaagagga ccactgggtt tcggagggtt 180
 tgcataaaca aagcagagct catcgacgta ctactgaga agctgggctc ggatcgctcg 240
 caagcgactg cggcggtgga gaacgttgct gacaccatcg tgcgcgccgt gcacaagggt 300
 gagagcgta ccatcacggg ctctgggtgtt ttcgagcagc gtcgtcgcg agcacgcgtg 360
 gcacgcaatc cgcgcaccgg cgagaccgtg aaggtcaagc ccacctcagt cccggcattc 420

| | | | | | | |
|------------|------------|------------|-------------|------------|------------|-----|
| cgtcccgccg | ctcagttcaa | ggctgttgct | tctggcgcac | agaagcttcc | ggccgagggg | 480 |
| ccggcggtca | agcgcggtgt | gaccgcgacg | agcaccgccc | gcaaggcagc | caagaaggct | 540 |
| ccggccaaga | aggctgccgc | gaagaaggcc | gcgcccggcca | agaaggctcc | ggcgaagaag | 600 |
| gctgcgacca | aggctgcacc | ggccaagaag | gccactgccg | ccaagaaggc | cgcgccggcc | 660 |
| aagaaggcca | ctgccgcca | gaaggctgca | ccggccaaga | aggctccggc | caagaaggct | 720 |
| gcgaccaagg | ctgcaccggc | caagaaggct | ccggccaaga | aggccgcgac | caaggctgca | 780 |
| ccggccaaga | aggctccggc | cgccaagaag | gcgcccggcca | agaaggctcc | ggccaagcgc | 840 |
| ggcgagcgca | agtaagtc | | | | | 858 |

<210> 201
 <211> 223
 <212> PRT
 <213> Mycobacterium vaccae

<400> 201

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Asn | Lys | Ala | Glu | Leu | Ile | Asp | Val | Leu | Thr | Glu | Lys | Leu | Gly | Ser |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Asp | Arg | Arg | Gln | Ala | Thr | Ala | Ala | Val | Glu | Asn | Val | Val | Asp | Thr | Ile |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Val | Arg | Ala | Val | His | Lys | Gly | Glu | Ser | Val | Thr | Ile | Thr | Gly | Phe | Gly |
| | | 35 | | | | 40 | | | | | 45 | | | | |
| Val | Phe | Glu | Gln | Arg | Arg | Arg | Ala | Ala | Arg | Val | Ala | Arg | Asn | Pro | Arg |
| | 50 | | | | 55 | | | | 60 | | | | | | |
| Thr | Gly | Glu | Thr | Val | Lys | Val | Lys | Pro | Thr | Ser | Val | Pro | Ala | Phe | Arg |
| 65 | | | | | 70 | | | | 75 | | | | | | 80 |
| Pro | Gly | Ala | Gln | Phe | Lys | Ala | Val | Val | Ser | Gly | Ala | Gln | Lys | Leu | Pro |
| | | | 85 | | | | | 90 | | | | | 95 | | |
| Ala | Glu | Gly | Pro | Ala | Val | Lys | Arg | Gly | Val | Thr | Ala | Thr | Ser | Thr | Ala |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Arg | Lys | Ala | Ala | Lys | Lys | Ala | Pro | Ala | Lys | Lys | Ala | Ala | Ala | Lys | Lys |
| | 115 | | | | | | 120 | | | | | 125 | | | |
| Ala | Ala | Pro | Ala | Lys | Lys | Ala | Pro | Ala | Lys | Lys | Ala | Ala | Thr | Lys | Ala |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Ala | Pro | Ala | Lys | Lys | Ala | Thr | Ala | Ala | Lys | Lys | Ala | Ala | Pro | Ala | Lys |
| 145 | | | | | 150 | | | | 155 | | | | | | 160 |
| Lys | Ala | Thr | Ala | Ala | Lys | Lys | Ala | Ala | Pro | Ala | Lys | Lys | Ala | Pro | Ala |
| | | | 165 | | | | | 170 | | | | | | 175 | |
| Lys | Lys | Ala | Ala | Thr | Lys | Ala | Ala | Pro | Ala | Lys | Lys | Ala | Pro | Ala | Lys |
| | | | 180 | | | | | 185 | | | | | 190 | | |
| Lys | Ala | Ala | Thr | Lys | Ala | Ala | Pro | Ala | Lys | Lys | Ala | Pro | Ala | Ala | Lys |
| | 195 | | | | | | 200 | | | | | 205 | | | |
| Lys | Ala | Pro | Ala | Lys | Lys | Ala | Pro | Ala | Lys | Arg | Gly | Gly | Arg | Lys | |
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<210> 202
 <211> 570
 <212> DNA
 <213> Mycobacterium vaccae

<400> 202

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| tccgtggcac | ccgacgacct | ggcgtcgatt | cgtaccggcc | gcgcgaaccc | cggcatgttc | 120 |
| aaccggatca | acatcgacta | ctacggcgcc | tccaccccca | tcacgcagct | gtccagcatc | 180 |
| aacgtgcccc | aggcgcgcat | ggtggtgata | aagccctacg | aggcgagcca | gctgcgcctc | 240 |
| atcgaggatg | cgatccgcaa | ctccgacctc | ggcgtcaatc | cgaccaacga | cggcaacatc | 300 |
| atccgggtgt | cgatcccgca | gctcaccgag | gagcgccgcc | gcgacctggg | caagcaggcc | 360 |
| aaggccaagg | gcgaggacgc | caaggtgtcg | gtgcgcaaca | tccgtcgcaa | ggcgatggag | 420 |

20250707 14:50:00

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<211> 187
<212> PRT
<213> Mycobacterium vaccae

<220>
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<222> (186)...(186)

<400> 203
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Asn Pro Gly Met Phe Asn Arg Ile Asn Ile Asp Tyr Tyr Gly Ala Ser
35 40 45
Thr Pro Ile Thr Gln Leu Ser Ser Ile Asn Val Pro Glu Ala Arg Met
50 55 60
Val Val Ile Lys Pro Tyr Glu Ala Ser Gln Leu Arg Leu Ile Glu Asp
65 70 75 80
Ala Ile Arg Asn Ser Asp Leu Gly Val Asn Pro Thr Asn Asp Gly Asn
85 90 95
Ile Ile Arg Val Ser Ile Pro Gln Leu Thr Glu Glu Arg Arg Arg Asp
100 105 110
Leu Val Lys Gln Ala Lys Ala Lys Gly Glu Asp Ala Lys Val Ser Val
115 120 125
Arg Asn Ile Arg Arg Lys Ala Met Glu Glu Leu Ser Arg Ile Lys Lys
130 135 140
Asp Gly Asp Ala Gly Glu Asp Glu Val Thr Arg Ala Glu Lys Asp Leu
145 150 155 160
Asp Lys Ser Thr His Gln Tyr Thr Asn Gln Ile Asp Glu Leu Val Lys
165 170 175
His Lys Glu Gly Glu Leu Leu Glu Val Xaa Pro
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<210> 204
<211> 1364
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<213> Mycobacterium vaccae

<400> 204
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aacaaggaca tcgagatcgt cgcggtcaac gacctcaccg acaacgccac gctggcgcac 240
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caggtccaga acctgcagga cggcccgcac aaggatctgc gccgggcccg cgccgcgcg 720

| | | | | | | |
|------------|-------------|-------------|-------------|------------|-------------|------|
| ctgaacatcg | tgccgacctc | caccgggtgcc | gccaaaggcca | tcggactggt | gctgccccgag | 780 |
| ctgaagggca | agctcgacgg | ctacgcgctg | cgggtgccga | tccccaccgg | ctcggtcacc | 840 |
| gacctgaccg | ccgagctggg | caagtcggcc | accgtggacg | agatcaacgc | cgcgatgaag | 900 |
| gctgcggccg | agggcccgt | caagggcatc | ctcaagtact | acgacgcccc | gatcgtgtcc | 960 |
| agcgacatcg | tcaccgatcc | gcacagctcg | atcttcgact | cgggtctgac | caaggtcatc | 1020 |
| gacaaccagg | ccaagggtcgt | gtcctggtag | gacaacgagt | ggggctactc | caaccgcctc | 1080 |
| gtcgacctgg | tgcacctggg | cggcaagtgc | ctgtaggggc | gagcgaagcg | acggggagaac | 1140 |
| agaggcgcca | tggcgatcaa | gtcactcgac | gaccttctgt | ccgaaggggt | gacggggcg | 1200 |
| ggcgactcgc | tgcgtccga | cctgaacgtc | ccctcgcacg | gcgacacgat | caccgaccgc | 1260 |
| ggcgcatca | tcgcctcggg | gccgacgttg | aaggcggtga | gtgacgccgg | cgccaagggtg | 1320 |
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<210> 205

<211> 340

<212> PRT

<213> Mycobacterium vaccae

<400> 205

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Val | Thr | Ile | Arg | Val | Gly | Val | Asn | Gly | Phe | Gly | Arg | Ile | Gly | Arg | Asn |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Phe | Phe | Arg | Ala | Leu | Asp | Ala | Gln | Lys | Ala | Glu | Gly | Lys | Asn | Lys | Asp |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Ile | Glu | Ile | Val | Ala | Val | Asn | Asp | Leu | Thr | Asp | Asn | Ala | Thr | Leu | Ala |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| His | Leu | Leu | Lys | Phe | Asp | Ser | Ile | Leu | Gly | Arg | Leu | Pro | Tyr | Asp | Val |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| Ser | Leu | Glu | Gly | Glu | Asp | Thr | Ile | Val | Val | Gly | Ser | Thr | Lys | Ile | Lys |
| 65 | | | | | 70 | | | | | 75 | | | | 80 | |
| Ala | Leu | Glu | Val | Lys | Glu | Gly | Pro | Ala | Ala | Leu | Pro | Trp | Gly | Asp | Leu |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Gly | Val | Asp | Val | Val | Val | Glu | Ser | Thr | Gly | Ile | Phe | Thr | Lys | Arg | Asp |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Lys | Ala | Gln | Gly | His | Leu | Asp | Ala | Gly | Ala | Lys | Lys | Val | Ile | Ile | Ser |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Ala | Pro | Ala | Thr | Asp | Glu | Asp | Ile | Thr | Ile | Val | Leu | Gly | Val | Asn | Asp |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Asp | Lys | Tyr | Asp | Gly | Ser | Gln | Asn | Ile | Ile | Ser | Asn | Ala | Ser | Cys | Thr |
| 145 | | | | | 150 | | | | | 155 | | | | 160 | |
| Thr | Asn | Cys | Leu | Gly | Pro | Leu | Ala | Lys | Val | Ile | Asn | Asp | Glu | Phe | Gly |
| | | | 165 | | | | | | 170 | | | | | 175 | |
| Ile | Val | Lys | Gly | Leu | Met | Thr | Thr | Ile | His | Ala | Tyr | Thr | Gln | Val | Gln |
| | | | 180 | | | | | 185 | | | | | 190 | | |
| Asn | Leu | Gln | Asp | Gly | Pro | His | Lys | Asp | Leu | Arg | Arg | Ala | Arg | Ala | Ala |
| | 195 | | | | | | 200 | | | | | 205 | | | |
| Ala | Leu | Asn | Ile | Val | Pro | Thr | Ser | Thr | Gly | Ala | Ala | Lys | Ala | Ile | Gly |
| | 210 | | | | | 215 | | | | | 220 | | | | |
| Leu | Val | Leu | Pro | Glu | Leu | Lys | Gly | Lys | Leu | Asp | Gly | Tyr | Ala | Leu | Arg |
| 225 | | | | | 230 | | | | | 235 | | | | 240 | |
| Val | Pro | Ile | Pro | Thr | Gly | Ser | Val | Thr | Asp | Leu | Thr | Ala | Glu | Leu | Gly |
| | | | 245 | | | | | | 250 | | | | | 255 | |
| Lys | Ser | Ala | Thr | Val | Asp | Glu | Ile | Asn | Ala | Ala | Met | Lys | Ala | Ala | Ala |
| | | | 260 | | | | | 265 | | | | | 270 | | |
| Glu | Gly | Pro | Leu | Lys | Gly | Ile | Leu | Lys | Tyr | Tyr | Asp | Ala | Pro | Ile | Val |
| | | 275 | | | | | 280 | | | | | 285 | | | |
| Ser | Ser | Asp | Ile | Val | Thr | Asp | Pro | His | Ser | Ser | Ile | Phe | Asp | Ser | Gly |
| | 290 | | | | | 295 | | | | | 300 | | | | |
| Leu | Thr | Lys | Val | Ile | Asp | Asn | Gln | Ala | Lys | Val | Val | Ser | Trp | Tyr | Asp |

[illegible]

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<210> 207
<211> 173
<212> PRT
<213> Mycobacterium vaccae
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| Thr | Tyr | Glu | Phe | Glu | Asn | Lys | Val | Thr | Gly | Gly | Arg | Ile | Pro | Arg | Glu |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Tyr | Ile | Pro | Ser | Val | Asp | Ala | Gly | Ala | Gln | Asp | Ala | Met | Gln | Tyr | Gly |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Val | Leu | Ala | Gly | Tyr | Pro | Leu | Val | Asn | Val | Lys | Leu | Thr | Leu | Leu | Asp |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Gly | Ala | Tyr | His | Glu | Val | Asp | Ser | Ser | Glu | Met | Ala | Phe | Lys | Val | Ala |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| Gly | Ser | Gln | Val | Met | Lys | Lys | Ala | Ala | Ala | Gln | Ala | Gln | Pro | Val | Ile |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Leu | Glu | Pro | Val | Met | Ala | Val | Glu | Val | Thr | Thr | Pro | Glu | Asp | Tyr | Met |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Gly | Glu | Val | Ile | Gly | Asp | Leu | Asn | Ser | Arg | Arg | Gly | Gln | Ile | Gln | Ala |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Met | Glu | Glu | Arg | Ser | Gly | Ala | Arg | Val | Val | Lys | Ala | Gln | Val | Pro | Leu |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Ser | Glu | Met | Phe | Gly | Tyr | Val | Gly | Asp | Leu | Arg | Ser | Lys | Thr | Gln | Gly |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Arg | Ala | Asn | Tyr | Ser | Met | Val | Phe | Asp | Ser | Tyr | Ala | Glu | Val | Pro | Ala |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Asn | Val | Ser | Lys | Glu | Ile | Ile | Ala | Lys | Ala | Thr | Gly | Gln | | | |
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<400> 208

Ala Leu Pro Gln Leu Thr Asp Glu Gln Arg Ala Ala
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